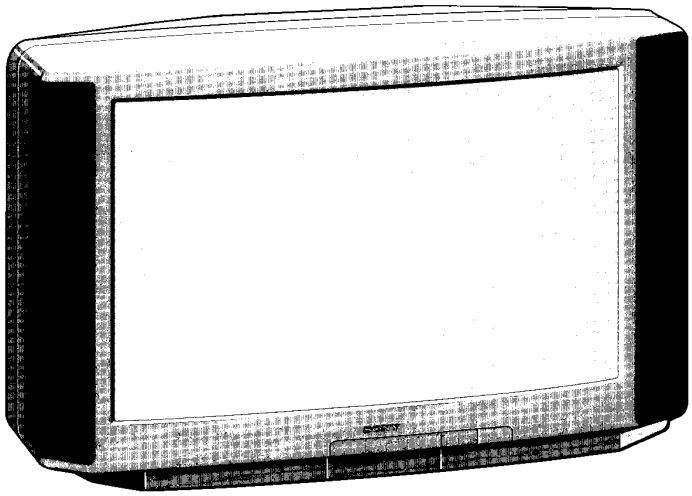
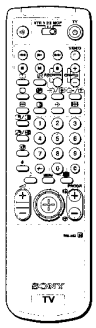
SERVICE MANUAL

AE-4 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-28WX2A	RM-862	Italian	SCC-K43D-A
KV-28WX2B	RM-862	French	SCC-K45D-A
KV-28WX2D	RM-862	AEP	SCC-K41D-A
KV-28WX2E	RM-862	Spanish	SCC-K42D-A





Super Trinitron

WIDE

TRINITRON® COLOR TV

SONY®

MICROFILM

MC-Service

ITEM MODEL	Television System	Channel Coverage	Colour System
Italian	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: S1-S20 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)
French	B/G/H, D/K, L, I	L SECAM VHF: F2-F10 UHF: F21-F69 TV CABLE TV (1) VHF: B-Q UHF: S21-S44 PAL B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 PAL I UHF: B21-B69 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, SECAM NTSC3.58/4.43 (video input only)
AEP	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: S1-S20 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)
Spanish	B/G/H, D/K	PAL B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)

MODEL	28WX2A	28WX2B	28WX2D	28WX2E
Power Consumption	119W	131W	135W	135 W

SPECIFICATIONS

Picture Tube — Super Trinitron WIDE
Approx. 71 cm (28 inches)
(Approx. 66 cm picture measured diagonally) 110° deflection

Rear/Front Terminals

[REAR]

21-pin Euro connector (CENELEC standard)
- Inputs for audio and video signals
- Inputs for RGB
- Outputs of TV video and audio signals

2/ S 2 21-pin Euro connector
- Inputs for audio and video signals
- Inputs for S video
- Outputs for audio and video signals (selectable)

Audio outputs (variable) - phono jacks
External speaker terminals : 2-pin DIN (5)

[FRONT]

3 Video input - phono jack
3 Audio inputs - phono jacks
3 S video input - 4 pin DIN
Headphones jack: stereo minijack

Sound output — 2x30W (music power), 2x15W (RMS)
Dimensions — 736x528x500 mm approx.
Weight — Approx. 39.0 kg
Supplied accessories — Remote Commander RM-862 (1)
Batteries R6 (2)
Aerial cable (1)

Other features
Digital comb filter (High resolution),
FASTEXT, DNR (Digital Noise Reduction),
Dolby Digital Surround System, 100Hz Digital Plus,
PAL plus, Multi PIP, Super Spectrum Sound,
NICAM stereo (KV-28WX2B and 28W2U only)

[RM-862]

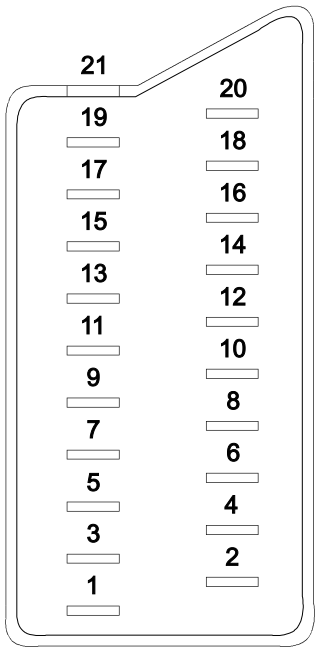
Remote control system	Infrared control
Power requirements	3V dc (2 batteries) R6 (size AA)
Dimensions	Approx. 210x56x24 mm (w/h/d)
Weight	Approx. 110g (Not including battery)

Design and specifications are subject to change without notice.

Item \ Model name	KV-28WX2A	KV-28WX2B	KV-28WX2D	KV-28WX2E
PIP	OFF	OFF	OFF	OFF
MPIP	ON	ON	ON	ON
Rotation Coil	ON	ON	ON	ON
VM Set (Velocity Modulation)	ON	ON	ON	ON
PAL +	ON	ON	ON	ON
Scart 1	ON	ON	ON	ON
Scart 2	ON	ON	ON	ON
Front in (3)	ON	ON	ON	ON
AKB in 16:9 mode	ON	ON	ON	ON
TXT	ON	ON	ON	ON
FLOF	ON	ON	ON	ON
TOP	ON	ON	ON	ON
Norm B/G/H	ON	ON	ON	ON
Norm I	OFF	ON	OFF	OFF
Norm D/K	ON	ON	ON	ON
Norm L	OFF	ON	OFF	OFF
Language Preset	Italian	French	German	Spanish

MC-Service

21 pin connector (1)



Pin No.	1	2	4	Signal	Signal Level
1	○	○	○	Audio output B (Right)	Standard level : 0.5V rms Output impedance : Less than 1k ohms*
2	○	○	○	Audio input B (Right)	Standard level : 0.5V rms Output impedance : More than 10k ohms*
3	○	○	○	Audio output A (Left)	Standard level : 0.5V rms Output impedance : Less than 1k ohm*
4	○	○	○	Ground (Audio)	
5	○	○	○	Ground (Blue)	
6	○	○	○	Audio input A (Left)	Standard level : 0.5V rms Output impedance : Less than 10k ohm*
7	○	●	●	Blue input	0.7 ± 3dB, 75 ohms, positive
8	○	○	○	Function select (AV control)	High state (9.5 - 12V) : Part mode Low state (0 - 2V) : TV mode Input impedance : More10k ohms Input capacitance : Less than 2nF
9	○	○	○	Ground (Green)	
10	○	○	○	Open	
11	○	●	●	Green	
12	○	○	○	Open	
13	○	○	○	Ground (Red)	
14	○	○	○	Ground (Blanking)	
15	○	—	—	Red input	0.7 ± 3dB, 75 ohms, positive
	—	○	○	(S signal) croma input	0.7 ± 3dB, 75 ohms, positive
16	○	●	●	Blanking input (Ys signal)	High state (1 - 3V) Low state (0 - 0.4V) Input impedance : 75 ohms
17	○	○	○	Ground (Video output)	
18	○	○	○	Ground (Video input)	
19	○	○	○	Video output	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
20	○	—	—	Video input	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
	—	○	○	Video input Y (S signal)	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
21	○	○	○	Common ground (plug, sheild)	

○ Connected ● Not Connected (Open) * at 20Hz - 20kHz

Pin No.	Signal	Signal Level
1	Ground	
2	Ground	
3	Y (S signal) input	1V ± 3dB 75 ohm, positive Sync. 0.3V -3 + 10dB
4	C (S signal) input	0.3V ± 3dB 75ohm, positive Sync.

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CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.
LE CHÁSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND, IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

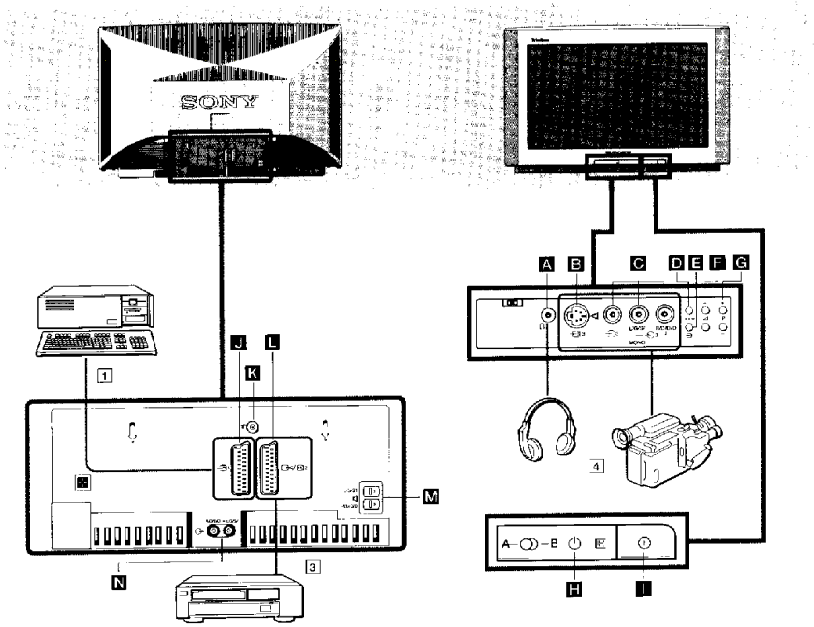
ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

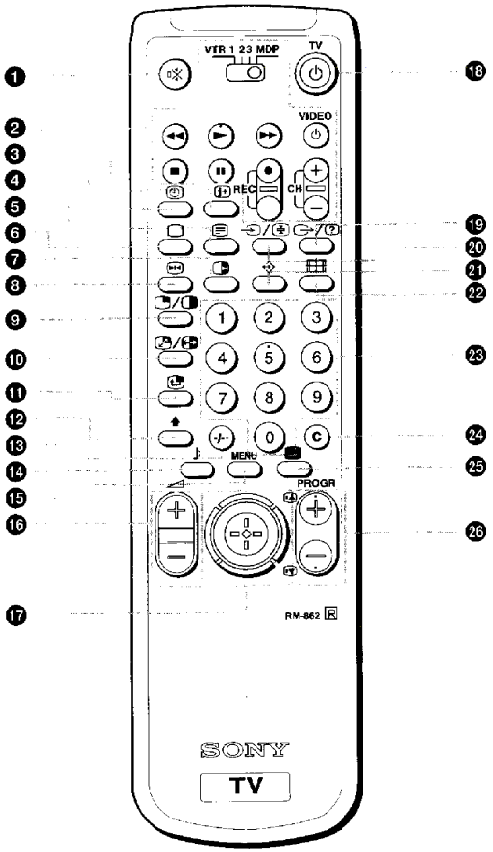
LES COMPOSANTS IDENTIFIÈS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES VUES EXPLOSÉES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE PUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

MC-Service

SECTION 1 GENERAL

The operating instructions mentioned here are partial abstracts from the Operating Instructions Manual. The page numbers of the Operating Instruction Manual remain as in the manual.



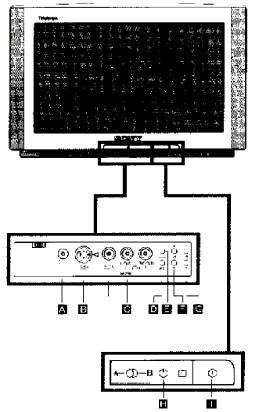


Overview

This section briefly describes the buttons and controls on the TV set and on the Remote Commander. Please open the flaps at the front and at the back of the Instruction Manual for detailed illustrations of the Remote Commander and the TV set. Letters in boxes refer to the buttons and connectors on the TV set, numbers in circles to the buttons on the Remote Commander. For more information, refer to the pages given next to each description.

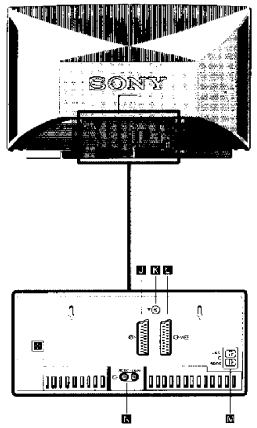
TV set – front

Reference and Symbol	Name	Refer to page
A	Headphones jack	35
B	S video input jack 3	40
C	Input jacks (video, audio) 3, 3	40
D	Reset button	28
E	Input mode button	28
F	Volume control +/-	28
G	P +/-	Programme buttons 28
H	Standby mode indicator	28
I	Main power switch	28



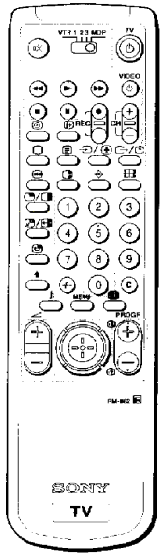
TV set – rear

Reference and Symbol	Name	Refer to page
J	1	21-pin Euro connector 40
K		Aerial socket 26
L	2/ 2	21-pin Euro connector 40
M	L/G/S/I R/D/D/D	Left and right speaker terminals 42
N	R/D/D/D L/G/S/F	Audio phono jacks 40



Remote Commander

Reference and Symbol	Name	Refer to page
1	Muting on/off button	28
2	**VCR operation**	41
	VTR 123 MDP	Video equipment selector 41
	◄◄ ► ►► ■ II ●	Video equipment operation buttons 41
	VIDEO, CH +/–	
3	On-screen display button	28
4	Time display button	28
5	Teletext button	28, 37
6	TV power on/TV mode button	28
7	No function on this set	
8	Freeze button	28
9	/I	No function on this set
10	/	No function on this set
11		No function on this set
12		No function on this set
13	- / - -	Double digit entering button 28
14		Sound mode button 34
15	MENU	Menu on/off button 29
16	+/-	Volume control buttons 28
17		Joystick for Menu selection 29
		Press to confirm selection (OK function)
18	TV	TV standby button 28
19		Output mode selector 40
		Teletext: Reveal button 37
20		Input mode selector 28
		Teletext: Freezing the subpage 37
21		Teletext: Favourite pages button 39
22		Screen format button 28
23	1, 2, ... 9, 0	Number buttons 28
24	C	Direct channel entering button 28
25		Picture mode button 34
26	PROGR +/-	Programme buttons 28
		Teletext: Page up/page down buttons 37



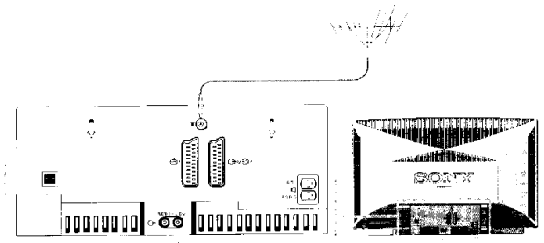
MC-Service

Basic Operation

Step 1 Installation

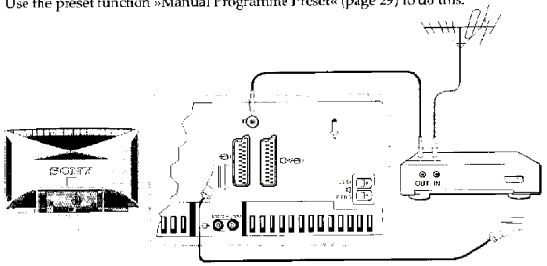
A Connecting the Aerial

(If you connect a VCR, skip to step B)
Insert the aerial plug of the supplied aerial cable tightly into the aerial socket ⊤ K.



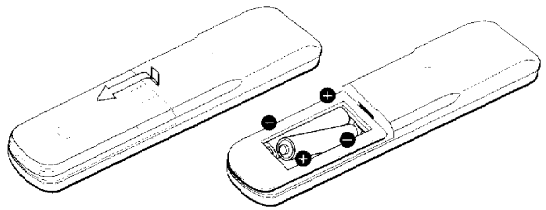
B Connecting a VCR

We recommend that you tune in the VCR signal to the programme position »0«.
Use the preset function »Manual Programme Preset« (page 29) to do this.



C Inserting the batteries into the Remote Commander

Insert the batteries checking the correct polarities.



! Respect your environment! Dispose of used batteries in an evironmental friendly way.

Step 2 Basic Presetting

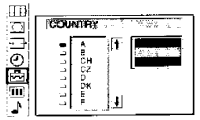
A Choosing the Menu Language and the Country

Using this function you select the language of the menu screens. Also you select the country in which you will use the TV. In this way the channels of the selected country will automatically get the top positions during automatic presetting.

1 Press the power switch ⏻ I on the TV. If the standby indicator ⏻ H on the TV is lit, press ▢ 6 or a number button 28 on the Remote Commander. Press the MENU button 15 on the Remote Commander. The menu LANGUAGE appears.

2 Push the joystick 17 to blue or green to select the language. Press the joystick 17 to confirm your selection. The menu COUNTRY appears.

3 Push the joystick 17 to blue or green to select the country in which you wish to operate the TV. Press the joystick 17 to confirm the selection.

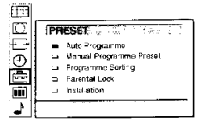


4 Press MENU 15 to restore the normal TV picture.

B Presetting Channels Automatically

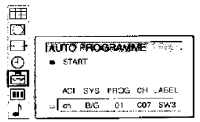
With this function the TV automatically searches and stores up to 100 channels onto programme positions. If you prefer »Manual Presetting of channels« please refer to page 29 in Advanced Operation.

1 Press MENU 15.



2 Push the joystick 17 to blue or green to select the symbol 🖃 on the menu screen, then push to yellow.

3 Push the joystick 17 to blue or green to select »Auto Programme«, then push to yellow. The menu AUTO PROGRAMME appears.



4 a) All items shown on the menu screen are as wanted: Press joystick 17 to select START. Now the automatic channel presetting starts from programme position 1.

or

4 b) You wish to change items as shown on the menu screen: Push the joystick 17 to blue or green. Push to yellow repeatedly until the desired item is highlighted.

Push the joystick 17 to blue or green to select the following possibilities:

ACI
(Automatic Channel Installation, depending on availability of service in your country)
on: fast channel presetting by special networks using the channel frequency (e.g. P055) TV-system and station label.
off: ACI is not active, only ITP (Intelligent Tuner Preset)

SYS (TV Broadcast System)
B/G for Western European Countries
D/K for Eastern European Countries

PROG (Programme Position)
Presetting automatically starts from position 1.

CH (channel)
C to start presetting with terrestrial channels
S to start presetting with cable channels

Press the joystick 17 as soon as the automatic presetting should start.

5 After presetting the normal TV picture reappears.

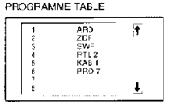
Joystick

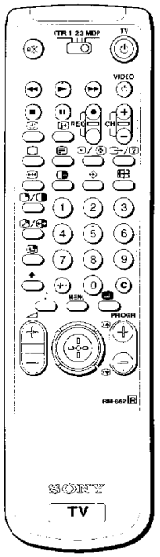
Step 3 TV operation

Using Direct Access Buttons

This section explains functions used while watching TV. Most operations are carried out using the Remote Commander (numbers in circles). All basic functions are also available on the TV set itself (letters in boxes).

To	Press
Switch on	• ○ I on TV.
Switch off temporarily (Standby mode)	• ⏻ ⓲. TV is now in standby mode and indicator ⏻ H lights up.
Switch on from standby mode	• ▢ ❻, PROGR +/- ⓴ G or any number button ㉔.
Switch off completely	• ⏻ I on TV. ! To save energy, we recommend to switch off your TV completely when TV is not in use.
Select programmes	• PROGR +/- ⓴ G or number buttons ㉔. For double digit number, press -/- - ⓭, then the two number buttons ㉔. E.g. for 24, press -/- - ⓭, then 2 and 4.
Display a programme table	• The joystick ⓱. Push the joystick ⓱ to blue or green to select a programme, then press the joystick ⓱ to confirm.
Display on screen indications	• ⓘ ❸. Press again to make the indications disappear.
Adjust the volume	• ◿ + or - ⓰ F.
Mute the sound	• 🔇 ❶. Press again to restore the sound.
Display the time (only available when teletext is broadcast)	• ⓘ ❹. Press again to make the display disappear.
Tune in a channel temporarily	• »C« ㉒ once for terrestrial channels, twice for cable channels. The indication »C« or »S« for cable channels appears. Enter the channel number with two digits, e.g. for 4, press 0, then 4.
View the input of a connected device (see also page 40)	• ⇥ ⓴ E repeatedly until the desired input signal appears. Press ▢ ❻ to restore the normal TV picture.
View teletext (see also page 37)	• ⓣ ❺ to switch on. Input a page number, using the number buttons ㉔ (e.g. for page 125, press 1, 2 and 5). ▢ ❻ to switch off.
Change the screen mode (see also page 36)	• ⊞ ㉒ repeatedly. The mode changes as follows: Auto Wide → Smart → Zoom/PAL Plus → Wide → 4:3
Freeze the picture	• ⓘ ❽. Press again to restore the normal TV picture.
Reset picture settings to factory levels	• →•← D.





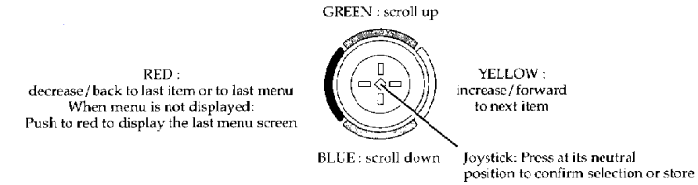
Advanced Operation

Using the Menu System

Use the following buttons on the Remote Commander to operate the Menu system:

1 Press MENU button ⓯ to switch menu on or off.

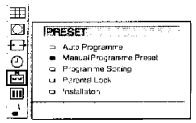
2 Use the joystick ⓱ as follows:


GREEN : scroll up
RED :
decrease/back to last item or to last menu
When menu is not displayed:
Push to red to display the last menu screen
YELLOW :
increase/forward
to next item
BLUE : scroll down
Joystick: Press at its neutral position to confirm selection or store

Advanced Presetting

Presetting Channels Manually

Using this function you can preset channels one by one to different programme positions. It is also convenient to allocate programme numbers to video input sources.

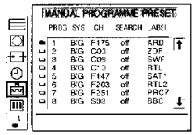


1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm the selection.

3 Push to blue or green to select »Manual Programme Preset«. Push to yellow to confirm the selection.

4 Push to blue or green to select the programme position (PROG) to which you want to preset a channel. Push to yellow to confirm.


MANUAL PROGRAMME PRESET
PROG SYS CH SEARCH ABC
1 B/G F175 off ARD
2 B/G C03 off ZDF
3 B/G C05 off SWF
4 B/G C12 off RTL
5 B/G F147 off SAT.1
6 B/G F203 off RTL2
7 B/G F251 off PRO7
8 B/G S08 off BBC

5 Push to blue or green to select the TV broadcast system (SYS) (B/G for western European countries, D/K for eastern European countries) or a video input source (EXT). Push to yellow to confirm.

6 Push to blue or green to select »C« (for terrestrial channels), »S« (for cable channels) or »F« (for channel frequency). Push to yellow to confirm.

There are two possibilities to preset channels manually:

a) You know the channel number or channel frequency.
Please use method »Direct input«.

or

b) You don't know the channel number or frequency.
Please use method »Search«.

continued >>>>>>>>>

MC-Service

7a) Direct Input

For channel numbers you need to input a two digit number, for the frequency a three digit number.

- Push to blue or green to select the first digit of the channel number or frequency. Push to yellow to confirm.
- Push to blue or green to select the second digit of the number or frequency. Push to yellow to confirm. In case of the channel number the search starts.
- Push to blue or green to select the third digit of the frequency number. Push to yellow to start the search of the frequency.
- To continue search for another channel: Push to blue or green.
- To store the selected channel: Press the joystick ⓱.
- Repeat steps 4 to 7a) to preset other channels.

7b) Search

- Push repeatedly to yellow until a blue and a green arrow appear in the section SEARCH.
- Push to blue or green to search for the next available channel.
- To continue search for another channel: Push to blue or green.
- To store the selected channel: Press the joystick ⓱.
- Repeat steps 4 to 7b) to preset other channels.

Captioning a Station Name

Channels are usually automatically labelled during presetting. You can, however, individually name a channel or a video source using up to five characters.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Manual Programme Preset«. Push to yellow to confirm.

4 Push to blue or green to select the programme position with the channel you want to label. Push to yellow repeatedly until the first element of the position LABEL is highlighted.

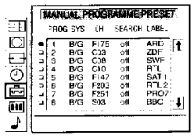
5 Push to blue or green to select a letter or a number (select »–« for a blank). Push to yellow to confirm. Select the other four characters in the same way.

6 After selecting all characters, press the joystick ⓱.

7 Repeat steps 4 to 6 to label other channels or video sources.

8 Press MENU ⓯ to restore the normal TV picture.

Joystick



Skipping Programme Positions

This function enables you to skip unused programme positions when selecting them with the PROGR +/- buttons. However, by using the number buttons you can still select the skipped programme position.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Manual Programme Preset«. Push to yellow to confirm.

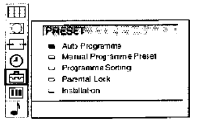
4 Push to blue or green to select the programme position you want to skip. Push to yellow to confirm.

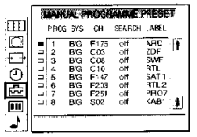
5 Push to blue or green to select »—« in the position SYS (system). Press the joystick ⓱ to confirm.

6 Repeat steps 4 and 5 to skip other programme positions.

7 Press MENU ⓯ to restore the normal TV picture.

Joystick





Sorting Programme Positions

This function enables you to sort the programme positions to a preferable order.

1 Press MENU ⓯.

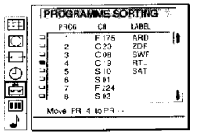
2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Programme Sorting«. Push to yellow to confirm.

4 Push to blue or green to select the programme position of the channel you want to exchange. Press joystick ⓱ to confirm.

5 Push to blue or green to select the programme position of the second channel. Press joystick ⓱ to confirm. Now the two programme positions are swapped and sorted.

6 Repeat steps 4 and 5 to sort other programme positions.



Using Parental Lock

This function enables you to prevent children watching undesirable broadcasts.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

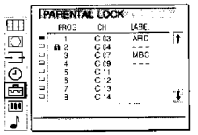
3 Push to green or blue to select »Parental Lock«. Push to yellow to confirm.

4 Push to green or blue to select the channel you want to block. Press the joystick ⓱ to confirm. The symbol 🔒 appears before the programme position to indicate that this channel is now blocked.

5 Repeat step 4 to block other channels.

6 Press MENU ⓯ to restore the normal TV picture.

! To unblock: Select the channel to unblock in the menu »Parental Lock«. Press the joystick ⓱. The symbol 🔒 disappears.



Using »Further Programme Preset«

Using the menu »Further Programme Preset« you can

a) individually adjust and store the volume level of each channel (Volume offset).

b) in case of picture distortions use manual fine tuning to obtain a better picture quality. The factory setting is »on« for AFT (Automatic Fine Tuning).

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Installation«. Push to yellow to confirm.

4 Push to blue or green to select »Further Programme Preset«. Push to yellow to confirm.

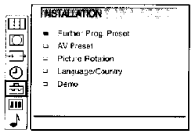
5 Push to blue or green to select the programme position you want. Push to yellow repeatedly to select
a) VOL (Volume Offset) or b) AFT (Automatic Fine Tuning). The selected item changes colour.

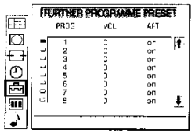
6a) VOL
Push to blue or green to adjust the volume for the selected programme position within a range of -7 to +7. Press the joystick ⓱ to confirm. Repeat step 6 to set the volume level for other programme positions.

b) AFT
Push to blue or green to fine-tune the channel within a range of -15 to +15. Press the joystick ⓱ to confirm. Repeat step 6 to fine-tune other channels.

7 Press MENU ⓯ to restore the normal TV picture.

Joystick





Using »AV Preset«

Using this function you can preset the desired input source (e.g. 🖵1, RGB signal) to the respective AV input (AV1). In this way a connected VCR switches automatically to the RGB signal. Also you can label the input sources.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Installation«. Push to yellow. Push to blue or green to select »AV Preset«. Push to yellow to confirm.

4 Push to blue or green to select the desired AV input. Push to yellow to confirm.

5 Push to blue or green to select the desired source. Push to yellow to confirm. For the respective AV inputs you have the following choice:
AV1: RGB or AV
AV2: YC2 or AV
AV3: YC3 or AV

6 To label a source: Push to blue or green to select the first character (letter or number, »-« for a blank). Push to yellow to confirm. Select the other four characters in the same way.

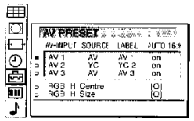
7 For automatic format and PAL plus selection (Auto 16:9):
Push to blue or green to select »On« for the AV input.

8 Press the joystick ⓱ to store.

9 Repeat steps 4 to 8 for the other AV inputs.

10 For RGB input source only: Push to blue or green to select RGB H Centre.
- Push to yellow to confirm.
- Push to blue or green to adjust the centre of the picture in a range of –5 to +5. Press the joystick ⓱ to store.
- Repeat step 10 to adjust RGB H Size.

11 Press MENU ⓯ to restore the normal TV picture.



Adjusting the Picture Rotation

If, due to the earth magnetism, the picture slants, you can use this function to readjust the picture.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

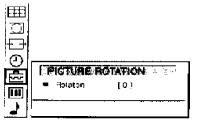
3 Push to blue or green to select »Installation«. Push to yellow to confirm.

4 Push to blue or green to select »Picture Rotation«. Push to yellow to confirm.

5 Push to yellow. Push to blue or green to adjust the picture rotation. The adjusting range is - 4 to + 4. Press the joystick ⓱ to confirm.

6 Press MENU ⓯ to restore the normal TV picture.

Joystick



MC-Service

Advanced TV operation

Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste.

1 Press ■ ㉖ (for Picture) or ♪ ⑱ (for Sound)
or
Press MENU ⑮.
Push joystick ⑰ to blue or green to select ▣ for Picture Control or ♪ for Sound Control. Push to yellow to confirm. The menu PICTURE CONTROL or SOUND CONTROL appears.

2 Push to blue or green to select the desired item. Push to yellow to confirm.

3 Push to red or yellow to adjust the selected item. Press the joystick ⑰ to confirm. For the effect of each control, see the following tables.

4 Repeat steps 2 and 3 to adjust other items.

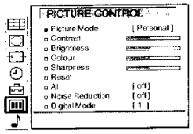
5 Press MENU ⑮ to restore the normal TV picture.

Picture Control

Item	Effect
Picture Mode	• Personal → Economy (energy saving setting) → Live → Sports → Movie → Game
Contrast	• Less ——|—— More
Brightness*	• Darker ——|—— Brighter
Colour*	• Less ——|—— More
Hue**	• Greenish ——|—— Reddish
Sharpness*	• Softer ——|—— Sharper
Reset	• Resets picture to the factory preset levels
AI	• Off: Normal On: Automatic optimization of contrast level according to TV signal
Noise Reduction	• Off: Normal On: Reduction of picture noise in case of weak signals
Digital Mode	• 1: Normal 2: LFR (Line Flicker Reduction) off

* Only if »Personal« or »Economy« is selected in »Picture Mode«.
** Available for NTSC colour system only.

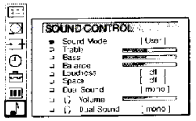
Joystick



Sound Control

Item	Effect
Sound Mode	• Choice between different sound effects User → Pop → Jazz → Rock
Treble*	• Less ——|—— More
Bass*	• Less ——|—— More
Balance	• More left ——|—— More right
Loudness*	• Off: normal On: for music broadcasts
Space	• Off: normal On: special acoustic effect
Dual Sound	• A: channel 1 or B: channel 2 Stereo → Mono
Headphones	
☊ Volume	• Less ——|—— More
☊ Dual Sound	• A: channel 1 or B: channel 2 Stereo → Mono

* Only if »User« is selected in »Sound Mode«



Using the Sleep Timer

This function enables you to select a time period after which the TV automatically switches into standby mode.

1 Press MENU ⑮.

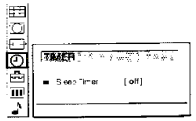
2 Push joystick ⑰ to blue or green to select the symbol ⏲ on the menu screen. Push to yellow to confirm.

3 Push to yellow. Push to blue or green to select the time
OFF → 10 min → 20 min ..... 80 min → 90 min.
Press the joystick ⑰ to confirm.

4 Press MENU ⑮ to restore the normal TV picture.

! One minute before the TV switches into standby mode, a message is displayed on the screen.

Joystick



Using »Multi PIP«

Using »Multi PIP« you can scan 12 successive TV channels on the screen (Programme Catching) or display 11 successive freeze pictures on the screen (Photo Mode).

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol ▦ on the menu screen. Push to yellow to confirm.

a) Programme Catching

Push to blue or green to select »Programme Catching«. Press the joystick ⓱. Now a scan of 12 successive programmes (11 still pictures, 1 live picture where the cursor is positioned) is displayed on the screen starting from the programme tuned in. Pushing the joystick to blue, green, red or yellow you can move the cursor in all directions and update the still pictures. When selecting a programme position lower or higher than the 12 displayed ones the programme scanning starts again.
Press MENU ⓯ to restore the normal TV picture.

Selecting a programme using Programme Catching:

Push the joystick ⓱ to blue, green, red or yellow to select the programme position you want, then press the joystick ⓱. Now the selected programme appears and you are back in the normal TV mode.

b) Photo mode

Push to blue or green to select »Photo mode«. Press the joystick ⓱. Now the main picture is displayed as a succession of 11 still pictures and a 12th picture, which is live. Push to blue or green to start the photo mode again. Press the joystick ⓱ to restore the normal TV picture.

Operating Screen Mode

Using Screen Mode you can change the aspect ration of the screen for wide screen effects, or reproduce the main picture image by image (Strobe function).

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol ▭ on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Screen Mode«. Push to yellow to confirm. Push to blue or green to select one of the following modes:

- Smart - imitation of wide screen effect (16:9) for 4:3 broadcasts.
- Zoom - imitation of wide screen effect (16:9) for movies broadcast in cinemascopic format.
- Wide - for 16:9 broadcasts or PAL+ for PAL+ broadcasts
- 4:3 - conventional 4:3 picture
- AutoWide - automatic selection of the optimum screen ratio (e.g. 4:3 picture automatically changes to Smart mode, 16:9 picture changes to Zoom mode)

Press the joystick ⓱ to confirm the selection.

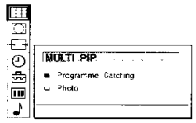
4 Only in Zoom / Auto Wide Mode: Changing the Screen position
In Zoom mode parts of the top and bottom of the picture are cut off. Using »Screen position« you can move the screen up- or downwards in order to see the cut-off parts (e.g. to read subtitles). Push to blue or green to select »Screen position«. Push to yellow to confirm
Push to blue or green to adjust the screen position (-10 to +10 or -5 to +5). Press the joystick ⓱ to confirm.

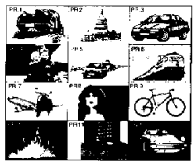
5 Strobe Mode
Push to blue or green to select »Strobe«. Push to yellow to confirm. The TV picture is now displayed image by image, creating a slow motion effect. Push to blue or green to select the speed of the motion. Press the joystick ⓱ to restore the normal TV picture.

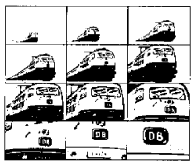
6 Auto 16:9
Push to blue or green to select »Auto 16:9«. Push to yellow to confirm.
Push to blue or green to select »On« for automatic selection of format or PAL plus in case of PAL plus broadcast or »Off« for normal mode.
Press joystick ⓱ to confirm.

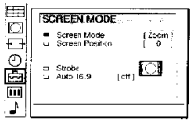
7 Press MENU ⓯ to restore the normal TV picture.

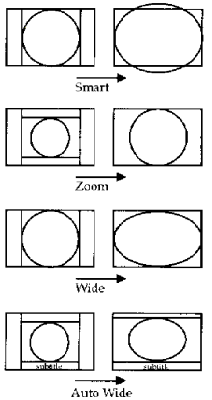
Joystick











Teletext

Most TV channels broadcast information via teletext. The index page of the broadcaster (usually page 100) informs you about how to use the service. Make sure to use a TV channel with a strong signal, otherwise Teletext errors may occur.

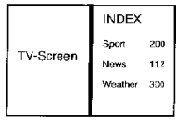
Direct Access Function

Switching Teletext on and off

1 Select the TV channel which carries the teletext service you want to view.

2 Press ▤ ❺ once for P&T (Picture and Teletext) The normal TV screen is displayed on the left, the Teletext screen on the right.
Press ▤ ❺ twice to get Teletext only.
Press ▤ ❺ three times for Mix mode. The normal TV screen and the Teletext screen are overlapped.

3 Press ▢ ❻ to switch Teletext off.



Selecting a Teletext page

Direct Page Selection
Use the number buttons ❷ to input three digits of the page number.
If you have made a mistake: Type in any three digits, then reenter the correct page number.

Page Catching
1 Select a teletext page with page numbers (e.g. index page).

2 Press the joystick ⓱ »Page Catching« is displayed at the top of the page.
Push joystick ⓱ to blue or green to select the page you want. Press the joystick ⓱
The requested page is displayed after some seconds.
Press ▤ ❺ to resume normal teletext reception.

Joystick

Accessing the next or preceding page

Press ▲ ❷ (Page +) or ▼ (Page -).

Freezing a teletext subpage

Press ❹ ❷. The symbol ❹ is displayed.
Press ▤ ❺ to resume normal teletext reception.

Revealing hidden information (e.g. for a quiz)

Press ❼ ❿. Press again to cancel.

Using Fastext

(only available, if the TV station broadcasts Fastext signals)

With Fastext you can access pages with one key stroke. When Fastext is broadcast, a colour-coded menu appears at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue marks on the Remote Commander.
Push the joystick ⓱ to the colour mark which corresponds to the colour-coded menu.
The page is displayed after some seconds.

continued >>>>>>>>>

MC-Service

Using the Teletext Menu

Your TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the buttons for menu operation to operate the teletext menu.
Select the teletext menu functions as follows:

1 Press MENU ⓯. The menu is superimposed on the teletext display.

2 Push the joystick ⓱ to blue or green to select the teletext function you want.
Push to yellow to confirm the selection.

USER PAGES/PRESET USER PAGES
See page 39 for information about presetting and operating the user pages.

INDEX
The index gives you an overview of the contents of the teletext you are using.

TOP/BOTTOM/FULL
For convenient reading of a teletext page you can enlarge the teletext page. After selecting the function, an information line »↑ Top ↓ Bottom OK Full« is displayed. Push joystick ⓱ to green to enlarge the upper half, push to blue to enlarge the lower half. Press the joystick ⓱ to resume the normal display. Press ☰ ❺ to resume normal teletext reception.

TEXT CLEAR
After selecting the function, you can watch a TV programme while waiting for a requested teletext page to be captured. When the page is available, the symbol ☰ changes colour. Press ☰ ❺ to view the requested page.

SUBTITLES
Check with your teletext service for information about subtitled TV programmes. After selecting the function the subtitles are displayed.

TIME PAGE
Check with your teletext service about the availability of time coded pages. If available, you can call up a page (e.g. an alarm page) at a certain time.

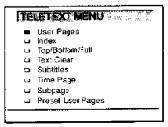
1 Select TIME PAGE in the teletext menu.
Push joystick ⓱ to yellow. An information window is displayed. Push to blue or green to select »On«. Push to yellow.

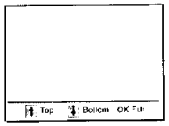
2 Use the number buttons ㉘ to enter the three digits of the page you want (e.g. 301).
Push to yellow after each digit.

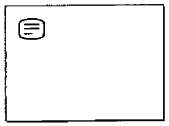
3 Use the number buttons ㉘ to enter the four digits of the desired time (e.g 18-54).
Push to yellow after each digit. Press joystick ⓱ to confirm. Press MENU ⓯. The time is displayed in the top left-hand corner of the screen.
At the requested time the page is displayed.

SUBPAGE
Using this function you can select a particular teletext page from several subpages (e.g. page 2 of 6 pages in total). After selecting the function an information line is displayed. Use the number buttons ㉘ to enter the four digits (e.g. enter 0002 for the second page of a sequence).
To cancel the request: Push joystick ⓱ to red and then to yellow.

Joystick







User Page Bank System

You can store up to 6 of your favourite teletext pages per Teletext service. In this way you have quick access to the pages you frequently use.

Storing pages

1 Press ☰ ❺ to switch Teletext on. Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select »Preset User Pages«.
Push to yellow to confirm.

3 Push to blue or green to select the bank (from A to E) you want.
Push to yellow to confirm.

4 Push to blue or green to select the three digits of your first favourite page.
Push to yellow after each digit. Push to yellow to confirm.

5 Repeat step 4 for the other 5 favourite pages. If you do not want to preset all 6 page numbers push to yellow without inserting any number. After finishing the presetting, press the joystick ⓱.

6 Push to blue or green to select »Allocate Bank«. Push to yellow to confirm.

7 Push to blue or green to select the programme position of the channel which carries the teletext service for which you have selected your favourite pages.
Push to yellow to confirm.

8 Push to blue or green to select the bank from step 3. Press the joystick ⓱ to confirm.

9 Repeat steps 3 to 8 for the other 4 banks available.

Displaying User Pages

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select »User Pages«. Push to yellow to confirm.

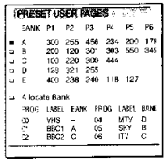
3 Push to blue or green to select the page you want. Press the joystick ⓱.
The page is displayed after some seconds.

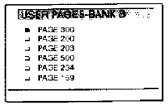
or

1 Press ✣ ㉑.

2 Push joystick ⓱ to blue or green to select the page you want. Press the joystick ⓱.

Joystick





Optional Equipment

Connecting Optional Equipment

You can connect a wide range of optional equipment to your TV. Refer to the illustrations on the back flap page of this Instruction Manual.

Symbol	Acceptable input signals	Available output signals
1	Normal audio/video and RGB	Audio/video from TV tuner
2/ 2	Normal audio/video and S video	Audio/video from selected source
3, 3	Normal audio/video and S video	No output
	No inputs	Audio from selected source

About S video input
Video signals may be separated into Y (luminance) and C (chrominance) signals. Separating the two signals prevents interference and thus improves the picture quality.

Tips:
- If the picture or sound is distorted, move the VCR away from the TV.
- When connecting a monaural VCR, connect only the white jack to both the TV and VCR.

Selecting Input and Output Signals

a) Direct Access Buttons

Selecting the Input
Press 20 E repeatedly to select one of the following input modes:

Symbol on the screen	Input signals	
1	Audio/video through Euro AV connector	J
	RGB through Euro AV connector	J
2	Audio/video through Euro AV connector	L
2	S video through Euro AV connector	L
3	Audio/video through the phono jacks	C
3	S video through the 4 pin DIN	B

Press 6 to restore the normal TV picture.

Selecting the Output from Euro AV connector 2/ 2 L
Press 19 repeatedly to select one of the following output sources for the connector 2/ 2 L:

Symbol on the screen	2/ 2 L connector output signal	
1	Audio/video from Euro AV connector	J
2	Audio/video from Euro AV connector	L
2	Audio/video from Euro AV connector	L
3	Audio/video from the phono jacks	C
3	Audio/video from the 4 pin DIN	B
TV	Audio/video from the aerial terminal	K

b) Using the Menu »Video Connection«

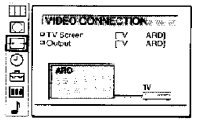
1 Press MENU 15.

2 Push joystick 17 to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »TV screen« (input source for TV-screen), or »Output« (output source for 2/ 2 L).
Push to yellow to confirm.
You can select between the following sources:
• TV: TV-tuner • YC: S video signal • AV: Audio/Video
TV screen: TV, AV1, RGB, AV2, YC2, AV3, YC3
Output: TV, AV1, AV2, YC2, AV3, YC3

4 Push to blue or green to select the desired source. Press joystick 17 to store.

5 Press MENU 15 to restore the normal TV picture.



Joystick

Remote Control of other Sony Equipment

Using the buttons 2 on the Remote Commander you can control other Sony equipment.

1 Set the selector VTR 1 2 3 MDP according to the equipment you want to control.
VTR 1: Beta VCR
VTR 2: 8mm VCR
VTR3: VHS VCR
MDP: Video Disk Player

2 Use the buttons 2 on the Remote Commander to operate the equipment.

Tips
- If your video equipment has a COMMAND MODE selector, set this selector to the same position as the VTR 1 2 3 MDP selector or the TV Remote Commander.
- If the equipment does not have a certain function, the corresponding button on the Remote Commander does not work.

MC-Service

Additional Information

Troubleshooting

Here are some simple solutions to problems which may affect the picture and sound.

Problem	Solution
No picture (screen is dark), no sound	• Plug the TV in. • Press ⏻ 1 on the TV. (If ⏲ indicator H is on, press 🖵 6 or a programme number 25 on the Remote Commander.) • Check the aerial connection. • Check if the selected video source is on. • Turn the TV off for 3 or 4 seconds and then turn it on again using ⏻ 1.
Poor or no picture (screen is dark), but good sound	• Press ● 29 to enter the PICTURE CONTROL menu and adjust »Brightness«, »Contrast« and »Colour«.
Poor picture quality when watching an RGB video source	• Press +⃝ 24 repeatedly to select 🙂.
Good picture but poor or no sound	• Press ◿ +16. • If 🔇 is displayed on the screen, press 🔇 1.
No colour for colour programmes	• Press ● 29 to enter the PICTURE CONTROL menu, select RESET, then press Joystick 17.
Remote Commander does not function.	• Replace batteries.

If you continue to have problems, have your TV serviced by qualified personnel. Never open the casing yourself.

Channel Guide

	Receivable Channels	Channel Displays
B/G/H	E2 .. 12, 21 .. 69	C02 C03 C04 .. C12 C21 .. C69
CABLE TV (1)	S1 .. 41	S01 S02 .. S41
CABLE TV (2)	S01 .. S05, M1 .. M10, U1 .. U10	S42 .. S46 S01 .. S10 S11 .. S20
ITALIA	A B C D E F G H H1 H2	C13 C14 C15 C16 C17 C18 C19 C20 C11 C12
D/K	R01 .. R12, R21 .. R69	C01 .. C12 C21 .. C69
CABLE TV (1)	———	S01 S02 ..S41
CABLE TV (2)	———	S42 S43 ..S46

For Your Safety

Televisions operate on extremely high voltages. To prevent fire or an electric shock, please follow the safety procedures below. For your own safety, never open the cabinet. Refer servicing to qualified personnel only.

For General Safety

- Do not expose the TV to rain or moisture.
- Do not open the rear cover.

For Safe Installation

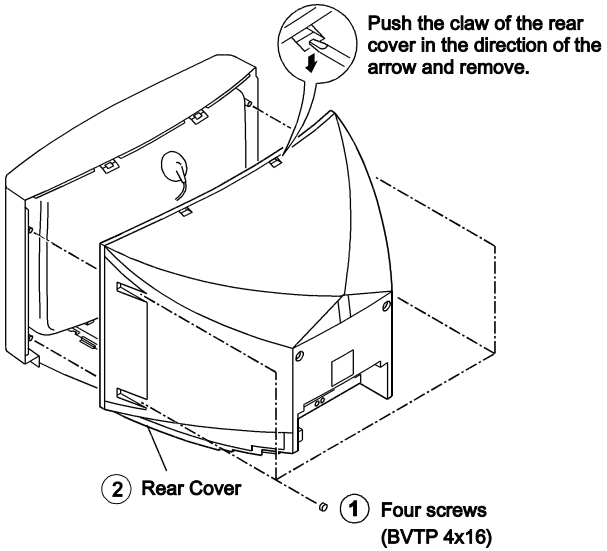
- Do not block or cover the ventilation openings. For ventilation, leave a space of at least 5 cm all around the set.
- Do not install the TV in hot, humid, or excessively dusty places.
- Do not install the TV where it may be exposed to mechanical vibrations.

For safe operations

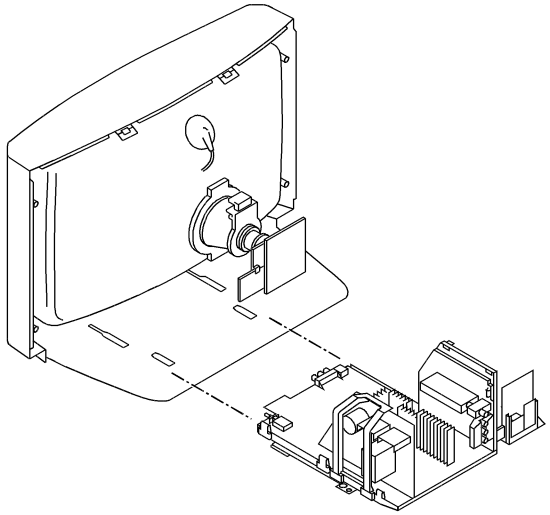
- Do not operate the TV on anything but 220 - 240V AC, 50 Hz.
- Unplug the TV if any liquid or solid object falls in it. Have it checked immediately!
- Unplug the TV if you are not going to use it for several days.
- When unplugging the TV, pull it out by the plug. Do not pull on the power cord!

SECTION 2
DISASSEMBLY

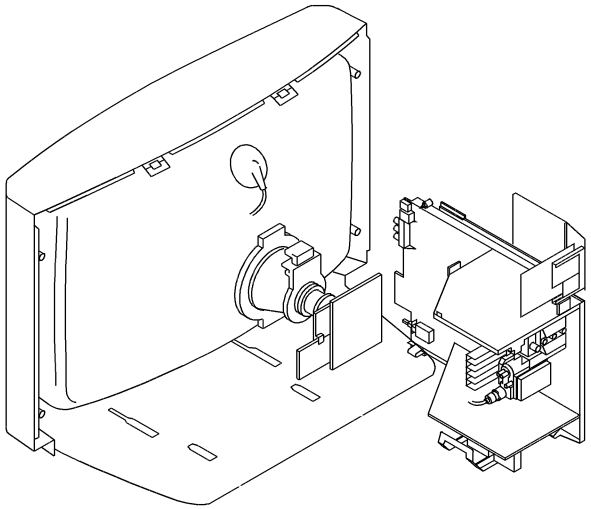
2-1. REAR COVER REMOVAL



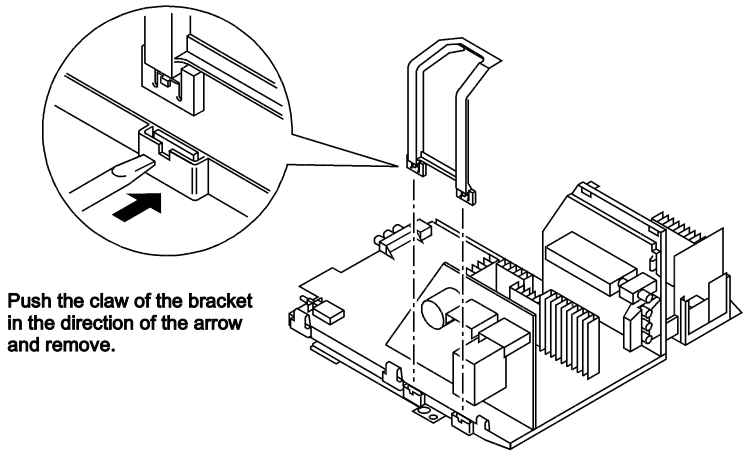
2-2. CHASSIS ASSY REMOVAL



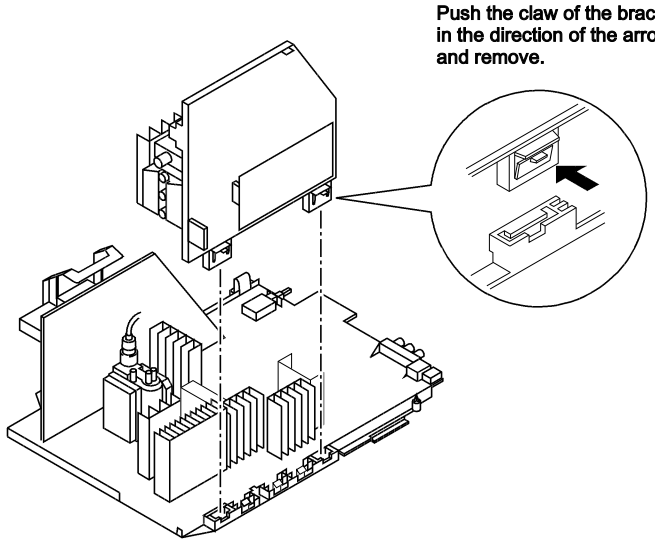
2-3. SERIVCE POSITION



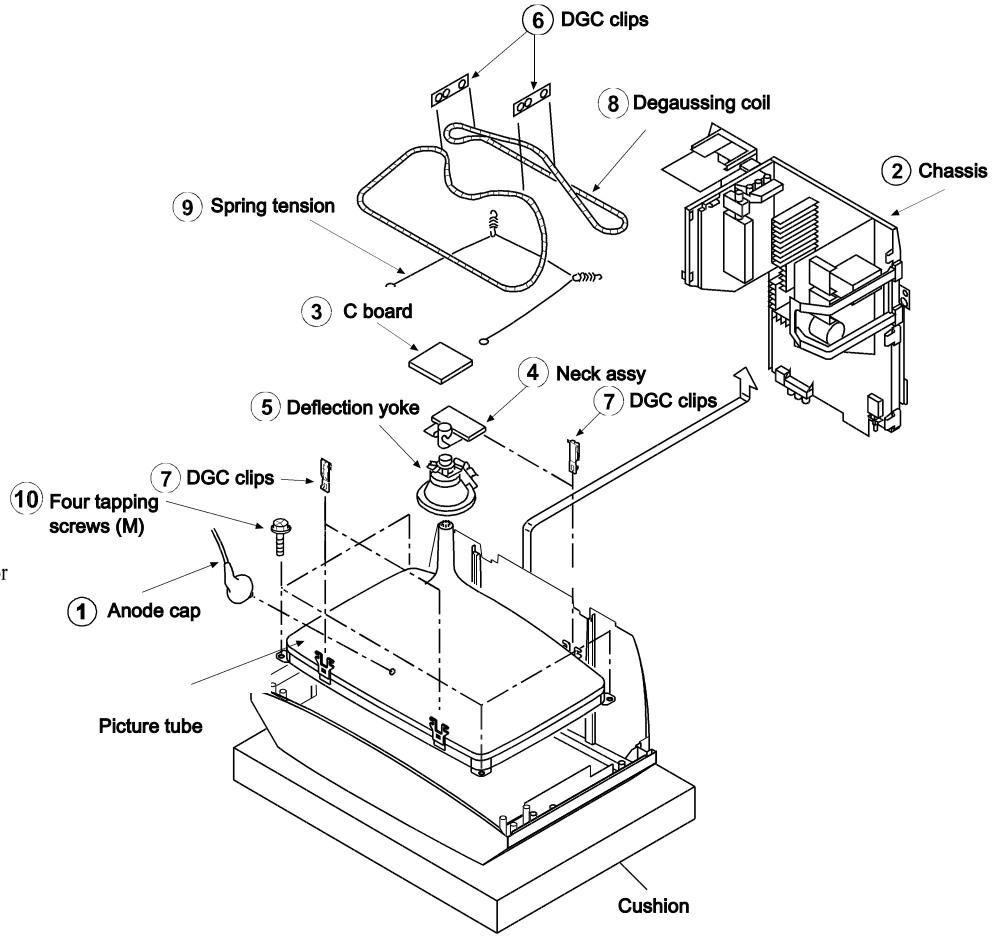
2-4. G BOARD REMOVAL



2-5. A BOARD REMOVAL



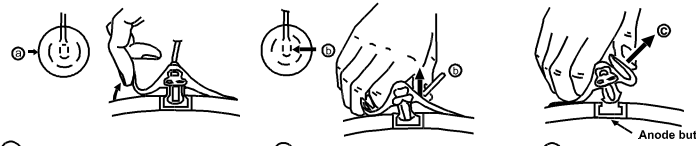
2-6. PICUTRE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

* REMOVING PROCEDURES.



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ

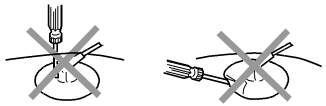
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ

• HOW TO HANDLE AN ANODE-CAP

① Don't damage the surface of anode-cap with sharp shaped material !

② Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.

③ Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



REMOVAL AND REPLACEMENT OF THE MAIN-BRACKET BOTTOM PLATES.

(1) REMOVING THE PLATES

In the event of servicing being required to the solder side of the D Board printed circuit, the bottom plates fitted to the main chassis bracket require to be removed. This is performed by cutting the gates with a sharp wire cutter at the locations shown and indicated by arrows.

Note : There are 5 plates fitted to the main bracket and secured by 4 or 6 gates. Only remove the necessary plate to gain access to the circuit board.

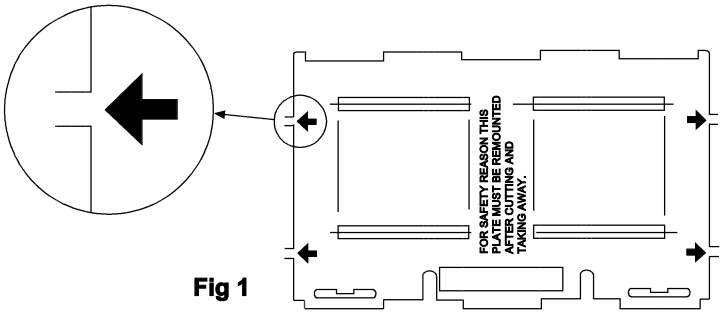


Fig 1

! For safety reasons, on no account should the plates be removed and not refitted after servicing.

(2) REFITTING THE PLATES

Because the plates differ in size it is important that the correct plates are refitted in their original location.
The plates are identified by markings A-B-C-D-E on their top side.

1. Identify the plate by locating its marking.
2. Turn the plate over noting where the marking is located.
3. Locate the corresponding marking indicated on the main chassis bracket. See Fig 2.
4. Refit the plate as indicated in Fig 3 with the markings located next to each other.

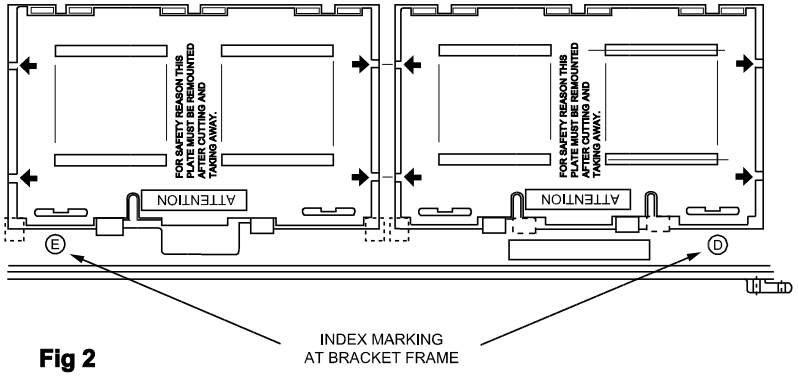


Fig 2

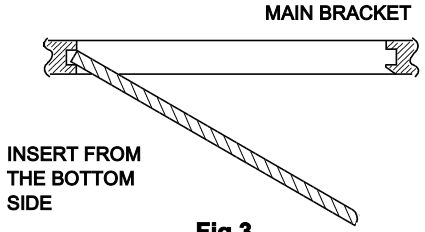


Fig 3

In the event of the plates requiring to be removed at a later stage, this can be achieved by inserting a screwdriver in the snap-recess indicated as in Fig 4 and lifting out.

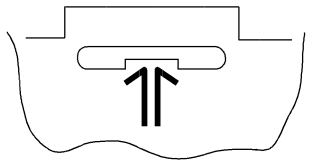


Fig 4

SECTION 3
SET-UP ADJUSTMENTS

- When complete readjustment is necessary or a new picture tube is installed, carry out the following adjustments.
- Unless there are specific instructions to the contrary, carry out these adjustment with the rated power supply.
- Unless there are specific instructions to the contrary, set the controls and switches as follows.

  Contrast ..... normal
  Brightness ..... normal

- Carry out the following adjustments in this order:

3-1. Beam landing
3-2. Convergence
3-3. Focus
3-4. White balance

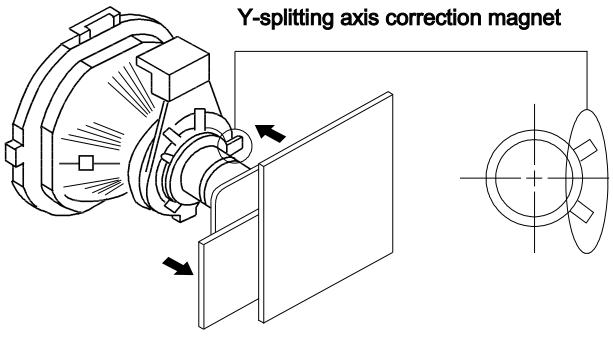
Note: Testing equipment required.
1. Color bar/pattern generator
2. Degausser
3. Vector scope

3-1. BEAM LANDING

Preparation:
1. In order to reduce the influence of geomagnetism on the set's picture tube face it in an easterly or westerly direction.
2. Switch on the set's power and degauss with the degausser.

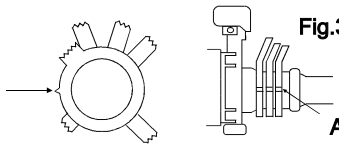
(1) Adjustment of Correction Magnet for Y-Splitting Axis

1. Input a crosshatch signal from the pattern generator.
2. Picture control is minimum and brightness control is still normal.
3. Position the neck assy as shown in Fig. 3-2.
4. Move the deflection yoke forward to touch the CRT and it stands up rightly.
5. Adjust the upper pin and the lower pin symmetrically by opening or closing the Y-splitting axis correction magnets on the neck assy.
6. Return the deflection yoke to its original position.



(2) Landing

Note: Before carrying out the following adjustments adjust the magnets as indicated below (See Fig.3-3).
1. Input an all-white signal from the pattern generator. Maximize the picture setting and adjust the brightness setting.
2. Rough-adjust the focus and horizontal convergence.
3. Loosen the deflection yoke screws, align the purity adjustment knob to the central position. (See Fig. 3-1)
4. Switch from the all-white pattern to an all-green pattern.
5. Move the deflection yoke backwards and adjust with the purity magnet so that the green is at the center and it aligns symmetrically. (See Fig. 3-4)
6. Move the deflection yoke forward and adjust so that entire screen becomes green.
7. Switch the raster signal to red, then to blue and verify the landing condition.
8. When the position of the deflection yoke has been determined, fasten the deflection yoke with the screw.
9. If the beam does not land correctly in all the corners, use magnets to correct it. (See Fig. 3-5)



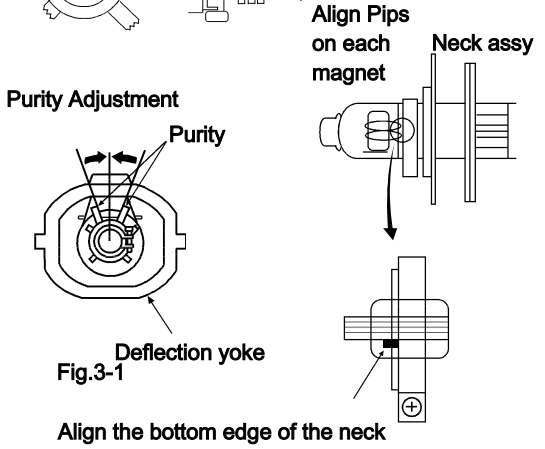


Fig.3-1

Align the bottom edge of the neck assy with the G3 hole center.

Fig.3-2

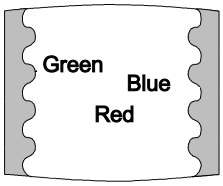


Fig.3-4

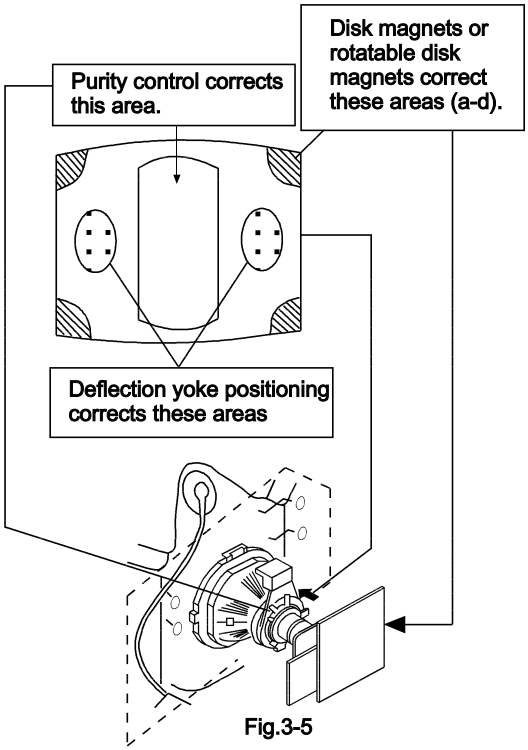
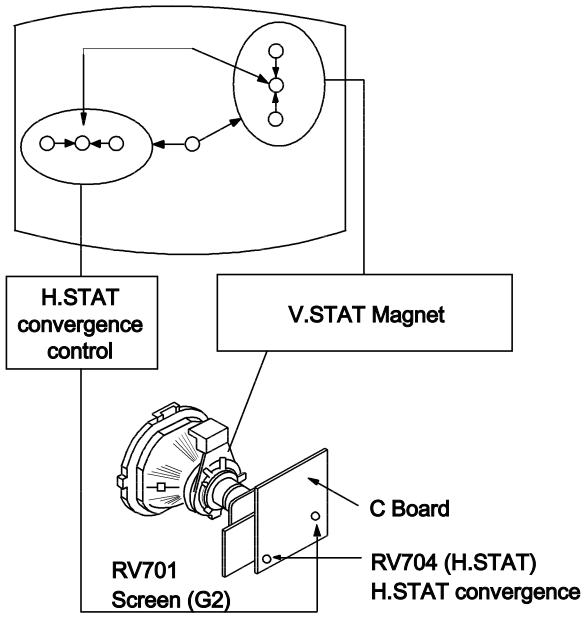

Disk magnets or rotatable disk magnets correct these areas (a-d).
Purity control corrects this area.
Deflection yoke positioning corrects these areas

Fig.3-5

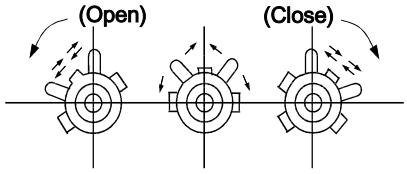
3-2. CONVERGENCE

(1) Screen center convergence (Static convergence)

1. Input a dot signal from the pattern generator. Normalize the picture setting.
2. (Moving horizontally), adjust the H.STAT control so that the horizontal red, green and blue dots coincide at the center of screen.
3. (Moving vertically), adjust the V.STAT magnet so that the vertical red, green and blue points coincide at the center of screen.

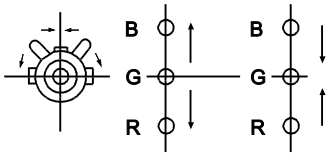


- If the horizontal dots are unable to coincide with the variable range of the H.STAT convergence, adjust together with the V.STAT convergence while tracking. (Adjust the convergence by tilting the V.STAT convergence or by opening or closing the V.STAT convergence.)

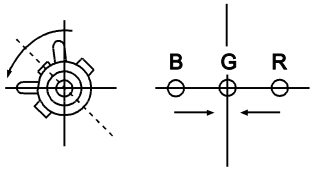


4. Movement of the red, green and blue dots by tilting the V.STAT magnet and by opening or closing the V.STAT magnet.

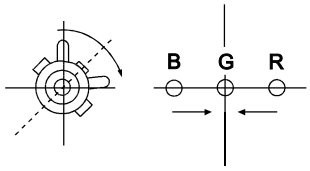
① By opening or closing the V.STAT magnet, the red, green and blue points move as shown below



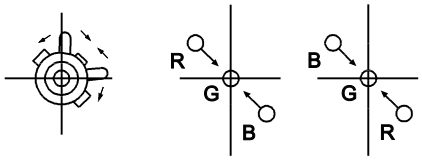
②By rotating the V. STAT magnet counterclockwise, the red, green and blue dots move as shown below.



③By rotating the V.STAT magnet clockwise, the red, green and blue dots move as shown below.



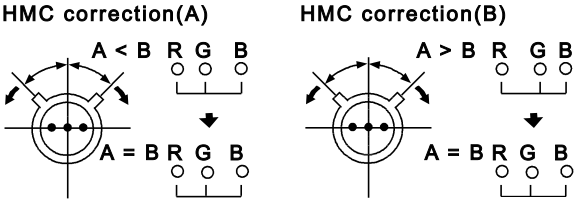
④By opening or closing the V.STAT magnet, the red, green and blue dots move as shown below.



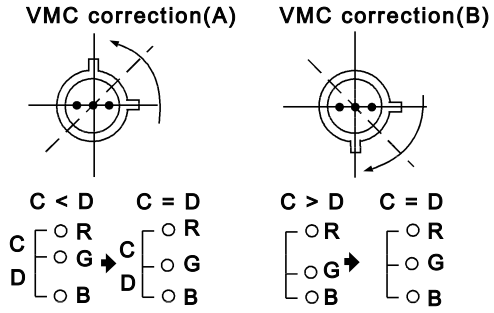
- If the blue dot does not coincide with the red and green points, correct the points by using the BMC (Hexapole) magnet.

⑤Correction for HMC (horizontal mis-convergence) and VMC (vertical mis-convergence) by using the BMC (Hexapole) magnet.

①HMC correction by BMC (Hexapole) magnet and movement of the electronic beam.



②VMC correction by BMC (Hexapole) magnet and movement of the electronic beam.



Layout of each control

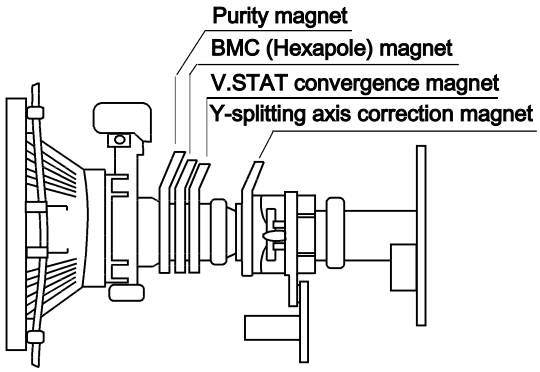
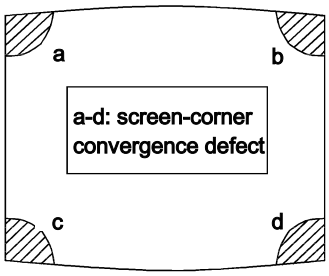
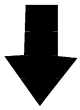
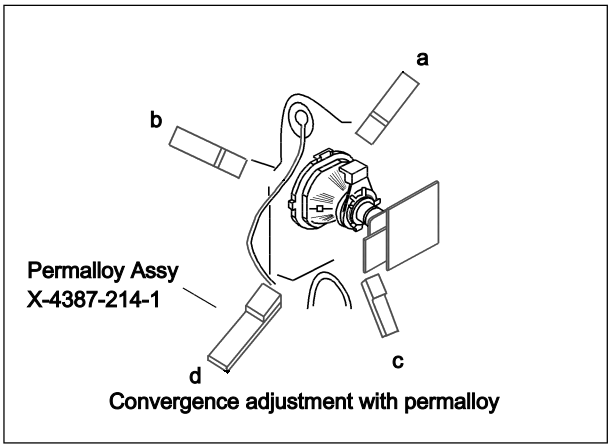


Fig.3-5

2. If you are unable to adjust the corner convergence properly, correct them with the use of permalloys.



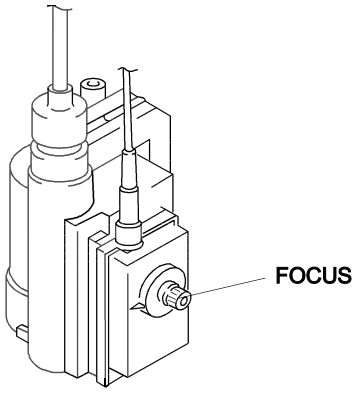




Convergence adjustment with permalloy

3-3. Focus

1. Receive a television broadcast signal.
2. Normalize the picture setting.
3. Adjust the focus control on the flyback transformer for the best focus at the center of the screen.
   Bring only the center area of the screen into focus, the magenta-ring appears on the screen. In this case, adjust the focus to optimize the screen uniformly.



3-4. Screen (G2), White balance (Adjustment in the service mode with remote commander)

G2 adjustment (RV701)

1. Input a dot signal from the pattern generator.
2. Set the Picture, Brightness and Colour to minimum.
3. Apply 170V DC from an external power supply to the R, G and B cathodes of the CRT.
4. While watching the picture, adjust the G2 control RV701 [SCREEN] on the C board to the point just before the return lines disappear.

White balance adjustment

1. Receive an all-white signal.
2. Enter into the Service Mode by pressing ' TEST ', ' TEST ' and ' MENU' on the Service Commander.
3. Select ' VIDEO PROC. ' from the on screen menu display and press OK .
4. The ' VIDEO PROC TDA4780' menu will appear on the screen.

Video Proc. TDA4780

Item No	Adjustment item	Data Amount
1	BRT	USER CONTROL
2	COL	USER CONTROL
3	PIC	USER CONTROL
4	HUE	USER CONTROL
5	R GAIN	31
6	G GAIN	Adj
7	B GAIN	Adj
8	R LVL REF	31
9	G LVL REF	Adj
10	B LVL REF	Adj
11	PEAK DRV LIMIT	63
12	GAMMA	31
13	SCP ON = 3LEV OFF = 2LEV	ON
14	DELAY	OFF

5. Set picture to MAX.
6. Set the ' R GAIN ' to 25.
7. Adjust the ' G GAIN ' and ' B GAIN ' so that the white balance becomes optimum.
8. Press the OK button to write the data for each item.
9. Set picture to MIN.
10. Set the ' R LVL REF ' to 31.
11. Adjust ' G LVL REF ', and ' B LVL REF ' with the left and right buttons so that the white balance becomes optimum.
12. Press the OK button to write the data for each item.

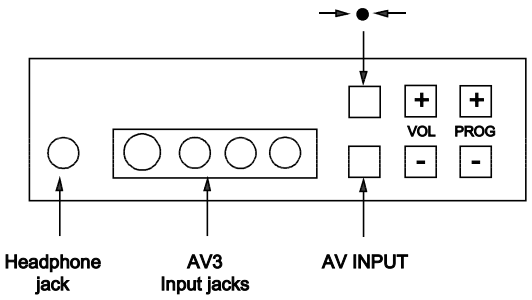
SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied remote commander, RM-862.

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power switch of the set while pressing the PROG + (plus) and PROG - (minus) buttons on the front panel.



2. "TT" will appear on the upper right corner of the screen.
3. Press " MENU " on the commander to get the service menu on screen.

DEVICES	
Init TV	
Pip, Lumisponder & Autoside	
Sub Adjust	
Video Proc	TDA4780
Col Dec Main	TDA9144
Deflect. Cont	SDA9361
Col Dec Sub	TDA9143
Feature Box	S87C654
AI	TDA9170
DA	SDA9280
Sound	
Line23 det	

4. Push the joystick up (green) or down (blue) on the remote commander to select the adjustment item.
5. Press the center button to proceed to the next menu.
6. If the adjustment item is 'Video Proc.', push the down button to move to 'Video Proc.'.
7. The Menu as indicated in Fig 4-3 will appear on the screen.
8. Move the joystick up or down to move to the adjustment item and press the center (OK) button.
9. Change the data in order to comply with each standard.

Item No	Adjustment item	Data Amount
1	BRT	USER CONTROL
2	COL	USER CONTROL
3	PIC	USER CONTROL
4	HUE	USER CONTROL
5	R GAIN	31
6	G GAIN	Adj
7	B GAIN	Adj
8	R LVL REF	31
9	G LVL REF	Adj
10	B LVL REF	Adj
11	PEAK DRV LIMIT	63
12	GAMMA	31
13	SCP ON = 3LEV OFF = 2LEV	ON
14	DELAY	OFF
15	DATA BUFF	OFF
16	NTSC MATRIX	OFF
17	HDTV	OFF
18	FSBL	OFF
19	AUTO CUT OFF	ON
20	FSW 2 DIS	OFF
21	FSW 2	OFF
22	FSW 1 DIS	OFF
23	FSW 1	OFF
24	ADAPT BLACK	OFF
25	Y HIGH 1V	OFF
26	MOD2	OFF
27	BLUE STRETCH	OFF
28	VM OUT	OFF
29	PEAK DRV ABS	ON
30	TIME CNST PEAK LIMIT	OFF

Fig. 4-3

SDA9361 (VIDEO PROC.)

Item No	Adjustment item	Data Amount
1	HDE	ON
2	VR	0
3	RABL	ON
4	BLK DIS	OFF
5	2FH 2*LINE FRQ	ON
6	STANDBY MODE	OFF
7	VERTICAL	ON
8	BSE BLK SELECT	OFF
9	SSE START SCAN	OFF
10	SRSE START RED SCAN	OFF
11	GBE GUARD BAND	OFF
12	STE SCAN TIME TABLE	OFF
13	NSA SELF ADAPTION	ON
14	V SHIFT	ADJ
15	V SIZE	ADJ
16	V LIN	ADJ
17	V S-COR	ADJ
18	V EHT COMP	25" = 78 29" = 100 28" = 36 32" =
19	H SIZE	ADJ
20	PIN PHASE	ADJ
21	PIN AMP	ADJ
22	UP COR PIN	ADJ
23	LOW COR PIN	ADJ
24	H EHT COMP	25" = 78 29" = 100 28" = 36 32" =
25	H SHIFT	ADJ
26	V ANGLE	ADJ
27	V BOW	ADJ
28	PWM START	0

Item No	Adjustment item	Data Amount
29	D/A	0
30	V BLK TIME	0
31	H BLK TIME	0
32	STAR V SCAN	0
33	H BLK PHASE	0
34	V SCAN WIDTH 0	0
35	V SCAN WIDTH 1	0
36	GUARD BAND	0
37	START RED SCAN	0
38	NUMBER FIELDS	1
39	NI NON INTERLACE	OFF
40	NR VSYNC NOISE RED	ON
41	SCC WITH VBL	ON
42	MIN LINES/FIELD	0
43	MAX LINES/FIELD	0
44	AFC EHT COMP	0
45	PLL FREQ	6
46	VCR	ON
47	GEN MOD	OFF
48	HSWID	ON
49	INT H PHASE	239
50	PWM WIDTH	0
51	NOISY VCR	OFF
52	KILLZIP	OFF
53	TC3RD	OFF
54	BANDGAP 4 OFF	OFF
55	BANDGAP OFF	OFF
56	BANDGAP	0

MC-Service

TDA4780 (VIDEO PROC.)

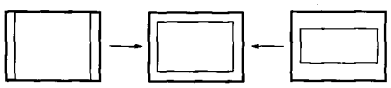
Item No	Adjustment item	Data Amount
1	BRT	USER CONTROL
2	COL	USER CONTROL
3	PIC	USER CONTROL
4	HUE	USER CONTROL
5	R GAIN	25
6	G GAIN	Adj
7	B GAIN	Adj
8	R LVL REF	31
9	G LVL REF	Adj
10	B LVL REF	Adj
11	PEAK DRV LIMIT	0
12	GAMMA	31
13	SCP ON = 3LEV OFF = 2LEV	ON
14	DELAY	OFF
15	DATA BUFF	OFF
16	NTSC MATRIX	OFF
17	HDTV	OFF
18	FSBL	OFF
19	AUTO CUT OFF	ON
20	FSW 2 DIS	OFF
21	FSW 2	OFF
22	FSW 1	OFF
23	FSW 1	OFF
24	ADAPT BLACK	OFF
25	Y HIGH 1V	OFF
26	MOD2	OFF
27	BLUE STRETCH	OFF
28	VM OUT	OFF
29	PEAK DRV ABS	ON
30	TIME CNST PEAK LIMIT	OFF

DEFLECTION SYSTEM ADJUSTMENT

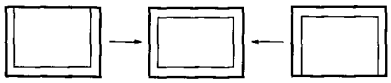
1. Enter into the service mode and select 'Deflect cont.'.The 'Deflect cont. SDA9361' adjustment menu will be displayed.
2. Select and adjust each item in order to get an optimum image.

Item No	Adjustment item	Data Amount
1	HDE	ON
2	VR	0
3	RABL	ON
4	BLK DIS	OFF
5	2FH 2*LINE FRQ	ON
6	STANDBY MODE	OFF
7	VERTICAL	ON
8	BSE BLK SELECT	OFF
9	SSE START SCAN	OFF
10	SRSE START RED SCAN	OFF
11	GBE GUARD BAND	OFF
12	STE SCAN TIME TABLE	OFF
13	NSA SELF ADAPTION	ON
14	V SHIFT	ADJ
15	V SIZE	ADJ
16	V LIN	ADJ
17	V S-COR	ADJ
18	V EHT COMP	25" = 78 29" = 100 28" = 36
19	H SIZE	ADJ
20	PIN PHASE	ADJ
21	PIN AMP	ADJ
22	UP COR PIN	ADJ
23	LOW COR PIN	ADJ
24	H EHT COMP	25" = 78 29" = 100 28" = 36
25	H SHIFT	ADJ
26	V ANGLE	ADJ
27	V BOW	ADJ
28	PWM START	0

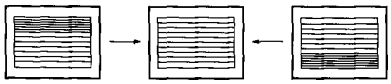
V SIZE



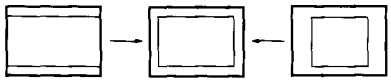
V POS



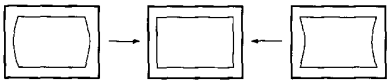
V LIN



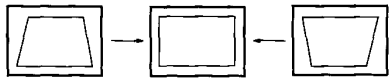
H SIZE



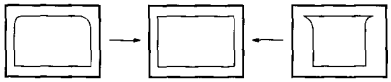
H PIN CUSH



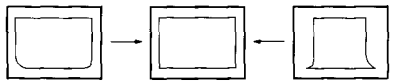
H TILT



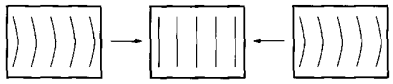
H UP COR



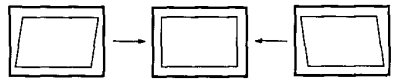
H LOWER COR



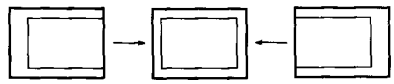
AFC V BOW



AFC V ANGLE



H POS



4-2. VOLUME ELECTRICAL ADJUSTMENTS

Sub Brightness Adjustment

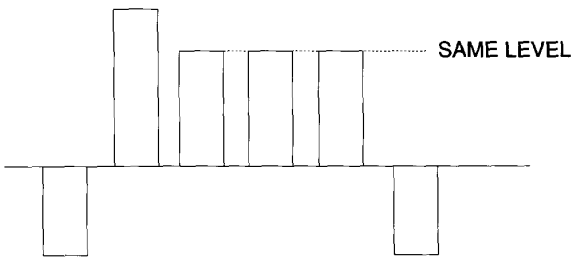
1. Enter Service Mode (Device Menu).
2. Select 'SUB ADJUST MENU'.

Sub adjustment
Sub Picture
Sub Color
Sub Brightness
4/3 Center
PAP H-Center
PAP HWE-Offset

3. Adjust the value according to the following advice.

Sub Color Adjustment

1. Input a PAL color bar signal.
2. Connect an oscilloscope to CN3703.
3. Enter into 'SERVICE MODE'.
4. Choose 'SUB ADJUST'.
5. Enter into Sub Color mode.
6. Adjust data so that the right sides of the waveforms are of equal height.



4-3. TEST MODE 2:

Is available by pressing the Test button twice, OSD "TT" appears. The functions described below are available by pressing the two numbers. To release Test Mode 2, press 0, 10, 20 .., twice or switch the TV into Standby Mode. Pressing the two Local Control buttons (+ and –) during Power ON will also switch into "TT" mode.
In TT mode, it is possible to remove the Menu from the screen by pressing the Speaker Off button once. Pressing the Speaker OFF button a second time will cause the menu to reappear . The Function is kept even when the menu is not displayed!!

00	Switch back to normal mode - TT mode off
01	Switch service menu on
02	Direct access to Noise reduction
03	Set volume to 30%
04	Service menu in "Service Mode"
05	Service menu in "Production Mode"
06	Set Volume to 80%
07	Aging Mode
08	Shipping Condition
09	Language Reset
10	The TT number will be deleted
11	Direct access to Balance
12	Direct access to Hue
13	Display of TV set configuration
14	Production Info Display
15	Read Analog from ROM
16	Save Analog F in NVM
17	This function presets the Labels for the AV sources: AV1, RGB, AV2, YC2, AV3, YC3, AV4, YC4.
18	No function
19	No function
20	See TT10
21	Picture Rotation automatic function: (-4) -> (+4) -> 0
22	Error Monitor Display
23	Direct access to Sub Brightness Adjustment.
24	Direct access to Sub Colour.
25	Status Menu Display
26	Text Character selection (Char set 06 -> West Europe)
27	Text Character selection (Char set 38 -> East Europe)
28	Text Character selection (Char set 40 -> West Europe) US English
29	Text Character selection (Char set55 -> West Europe) Turkish
30	See TT10

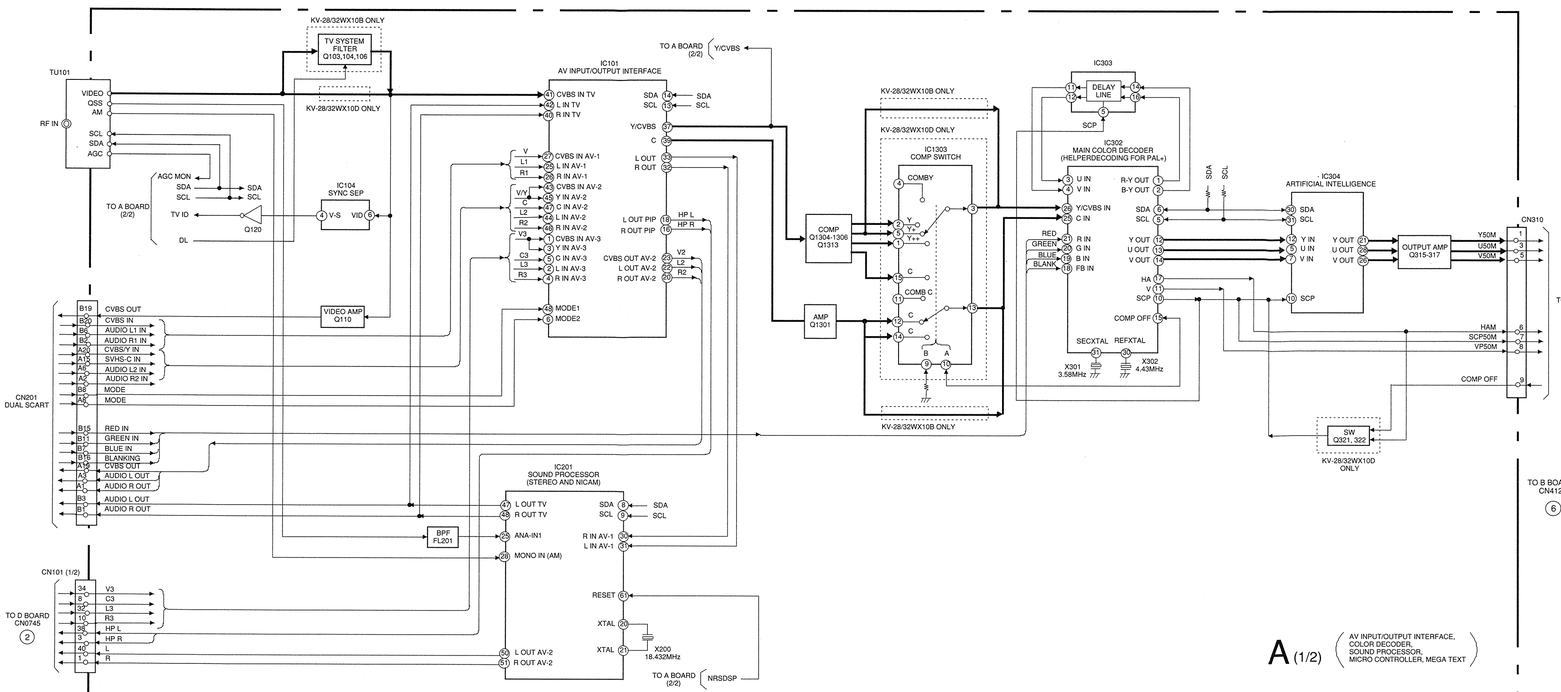
31	no function
32	no function
33	no function
34	no function
35	no function
36	no function
37	no function
38	Screen Position
39	Reset Programme Table
40	See TT10
41	Picture Min
42	no function
43	no function
44	no function
45	Set NVM to Protect mode
46	IR Channel Pressetting Mode. The channel pressetting can be done by a Special transmitter. Sequence: TT46 -> --PR Number select display appears Select Prog. No. from where the channel shall be stored. --> Now TV is waiting for IR sequence <-- --> If no IR transmission starts TT46 is released after 20 secs <--! Note: when TT46 is active, any transmission will be interpreted as PROG data !
47	no function
48	no function
49	New Initialize
50	See TT10
51	Strobo mode is activated.
52	no function
53	no function
54	Direct access to Velocity Modulation VM (Production use)
55	Slicer High
56	Slicer No
57	Megatext Service Menu on
58	MTX Small Framing Code Window

MC-Service

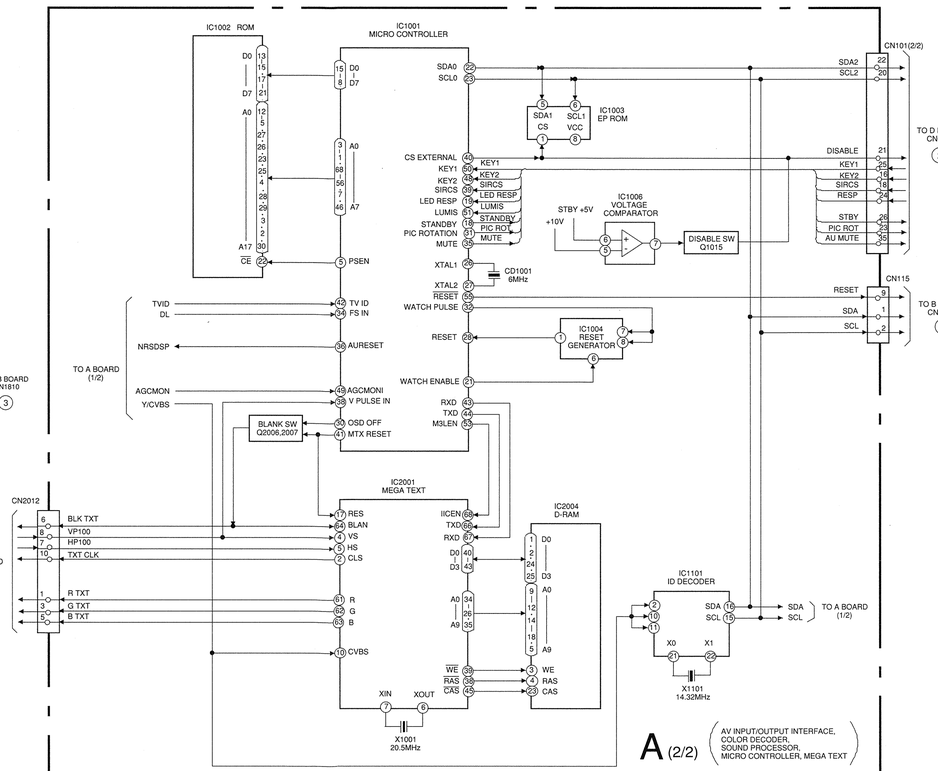
59	MTX Wide Framing Code Window
60	See TT10
61	no function
62	no function
63	no function
64	Reset all IIC Slave commands (Production use)
65	Reset stored error codes in NVM
66	Feature box and Pal Plus
67	no function
68	Ignore Errors - on
69	Ignore errors - off
70	See TT10
71	no function
72	no function
73	Megatext RGB textlevel one step decreased.
74	Megatext RGB textlevel one step decreased (max 1 steps down starting from E0h) (Production use)
75	no function
76	SDA9361
77	SDA9280
78	PIP
79	no function
80	See TT10
81	S87C654 Default data setting
82	TDA9170 Default data setting
83	SAA 7185WP Default data setting
84	TDA4780 Default data setting
85	TDA9144 Default data setting
86	TDA9143 Default data setting
87	no function
88	Char set Russian
89	Char set Russian (esc)
90	See TT10

SECTION 5
DIAGRAMS

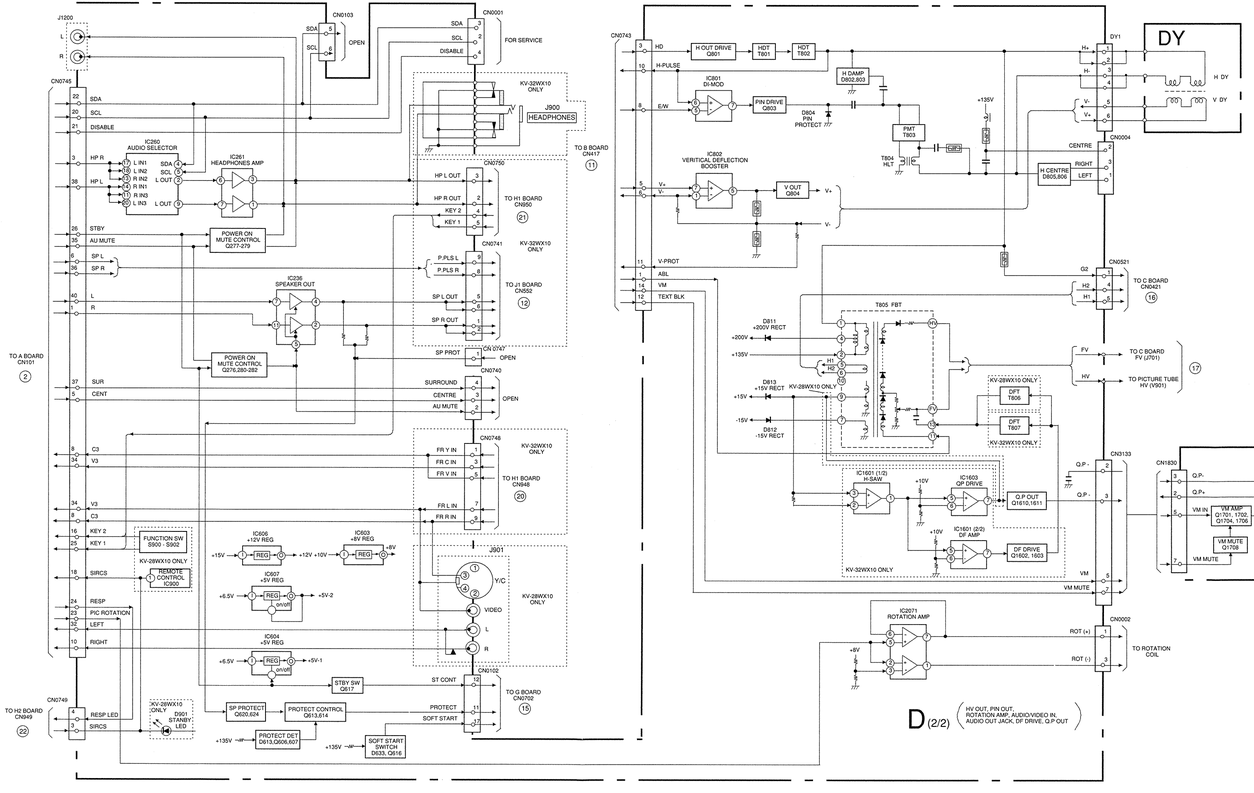
BLOCK DIAGRAM (1)



BLOCK DIAGRAM (2)



BLOCK DIAGRAM (3)



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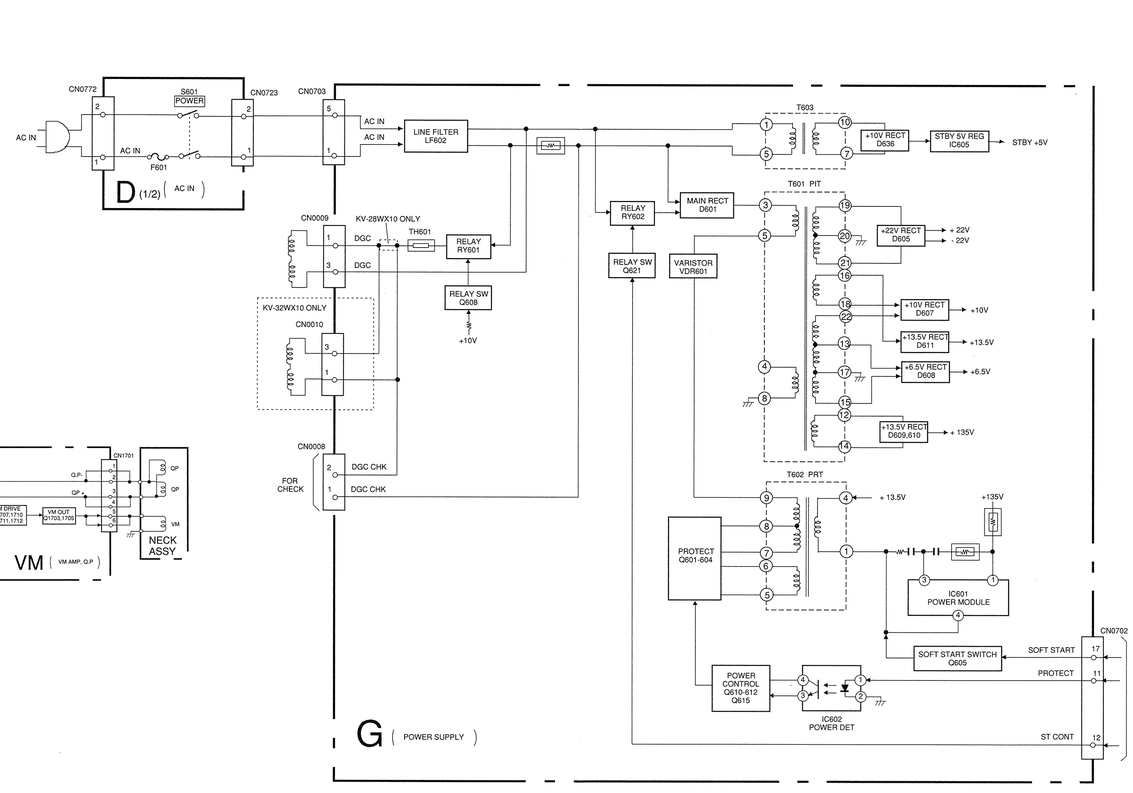

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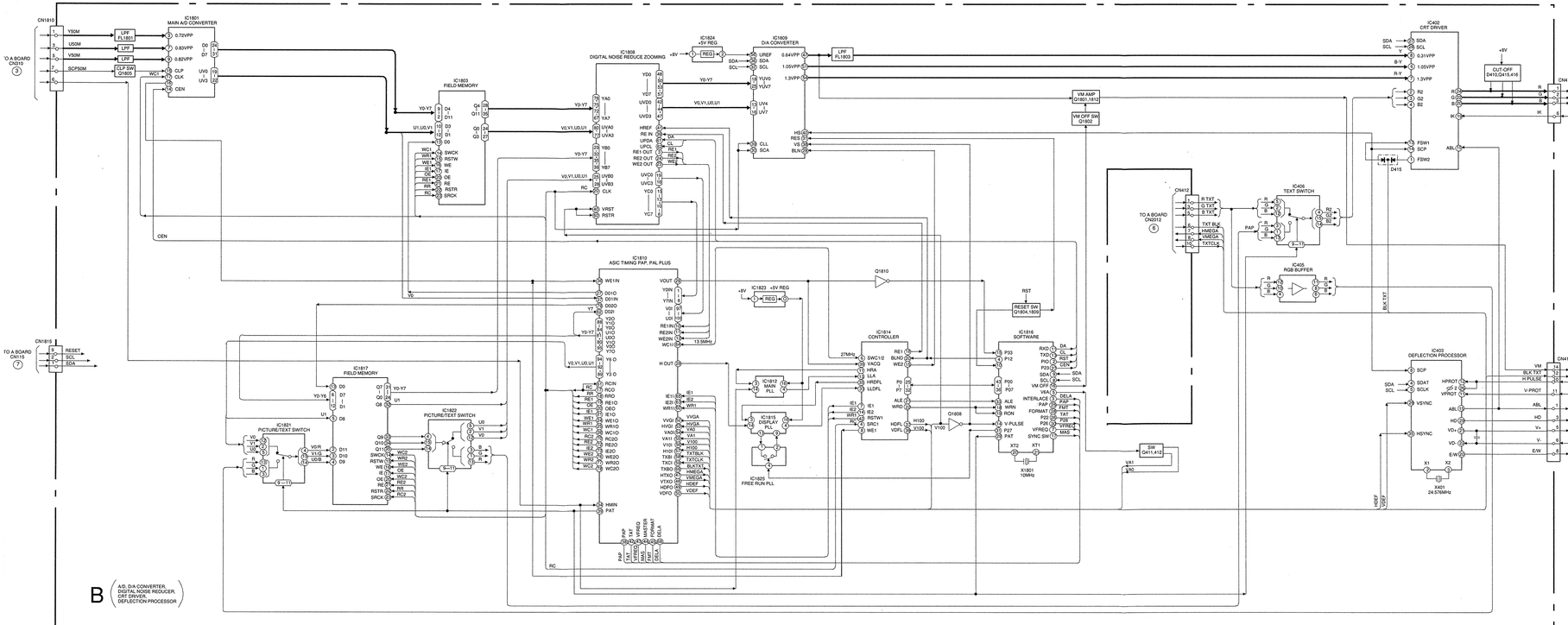
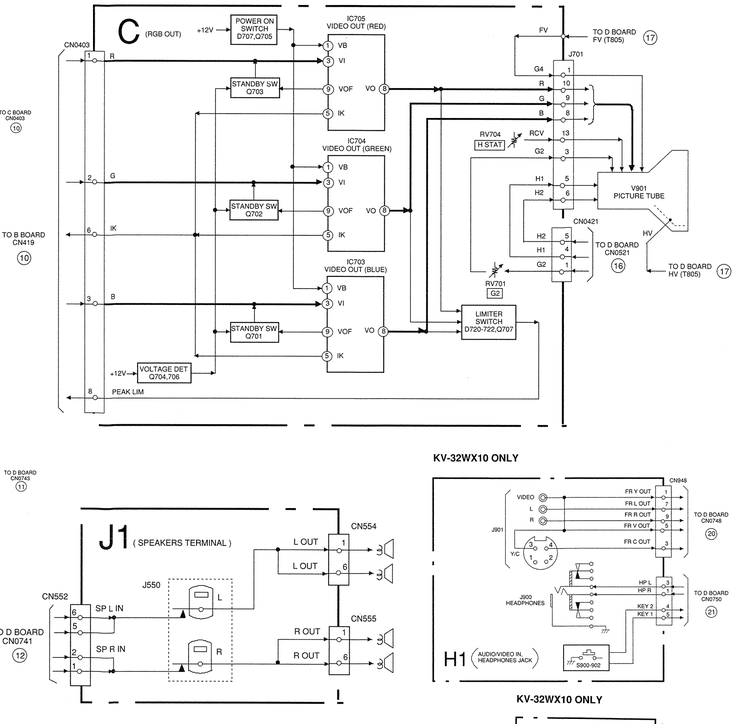
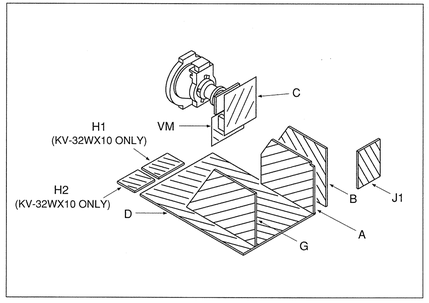


BLOCK DIAGRAM (6)

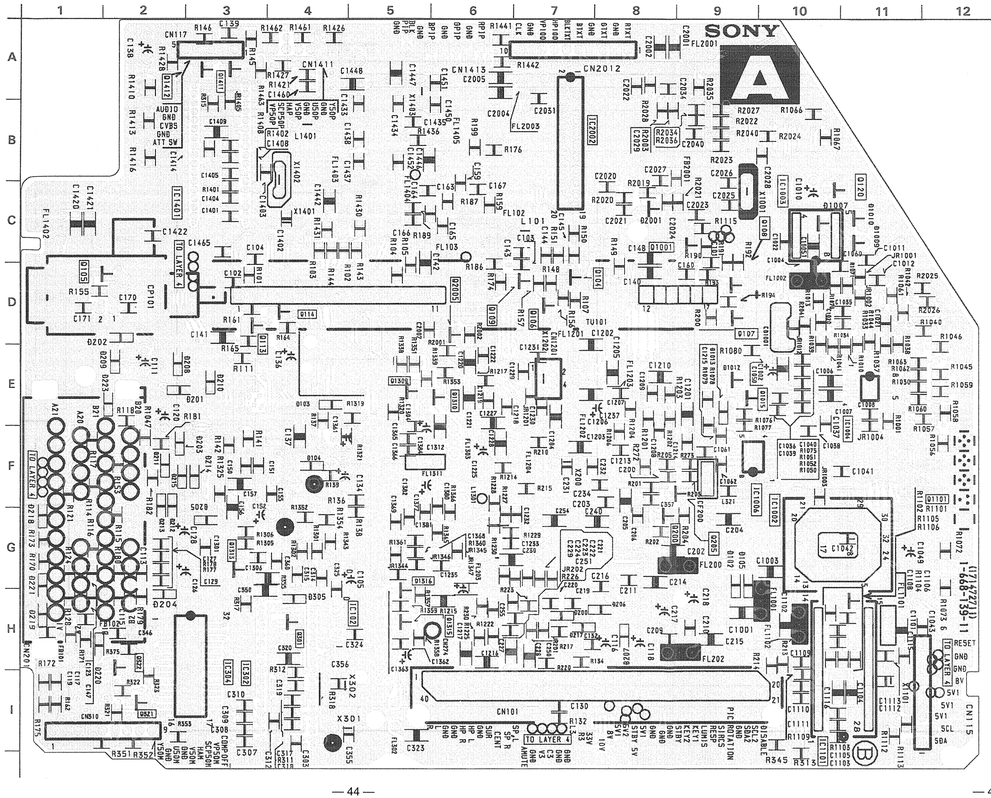


A AV INPUT/OUTPUT INTERFACE, DIGITAL COMB FILTER, COLOR DECODER,SOUND PROCESSOR, MICRO CONTROLLER, MEGA TEXT

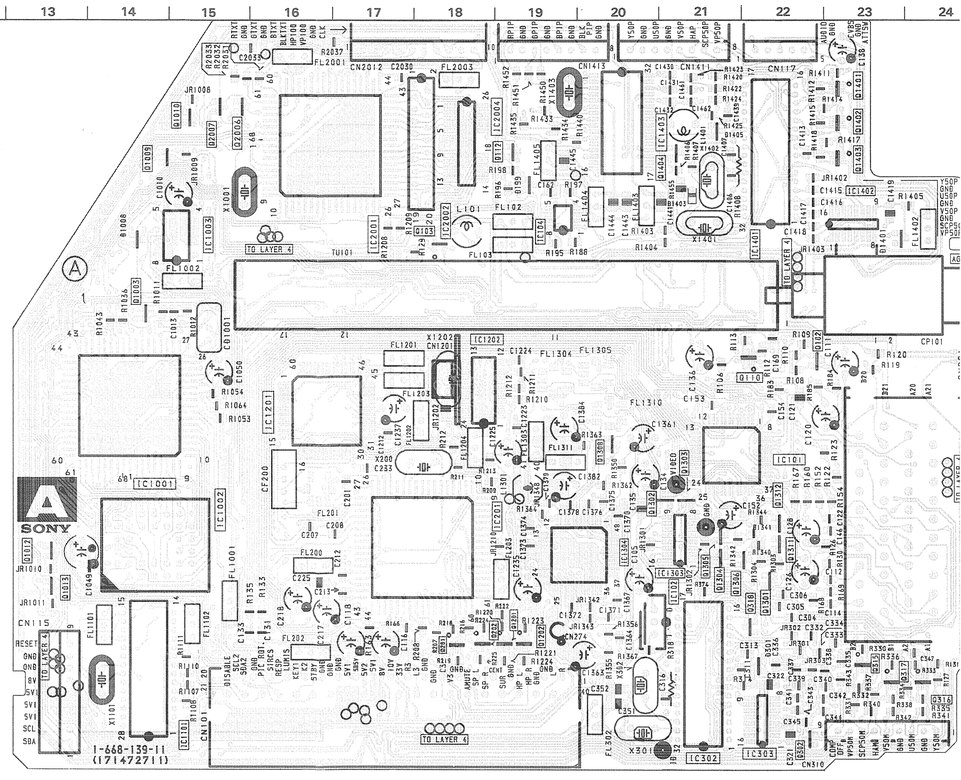
5-2. CIRCUIT BOARDS LOCATION



A Board < Conductor Side >



A Board < Component Side >



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms. k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm
Rating electrical power ¼ W

- : nonflammable resistor.
- : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth - ground.
- ⏚ : earth - chassis.
- ⧺ : no mounted.

Note : The components identified by shading and marked ↑ are critical for safety. Replace only with the part number specified.

Note : Les composants identifies par une trame et une marque ↑ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

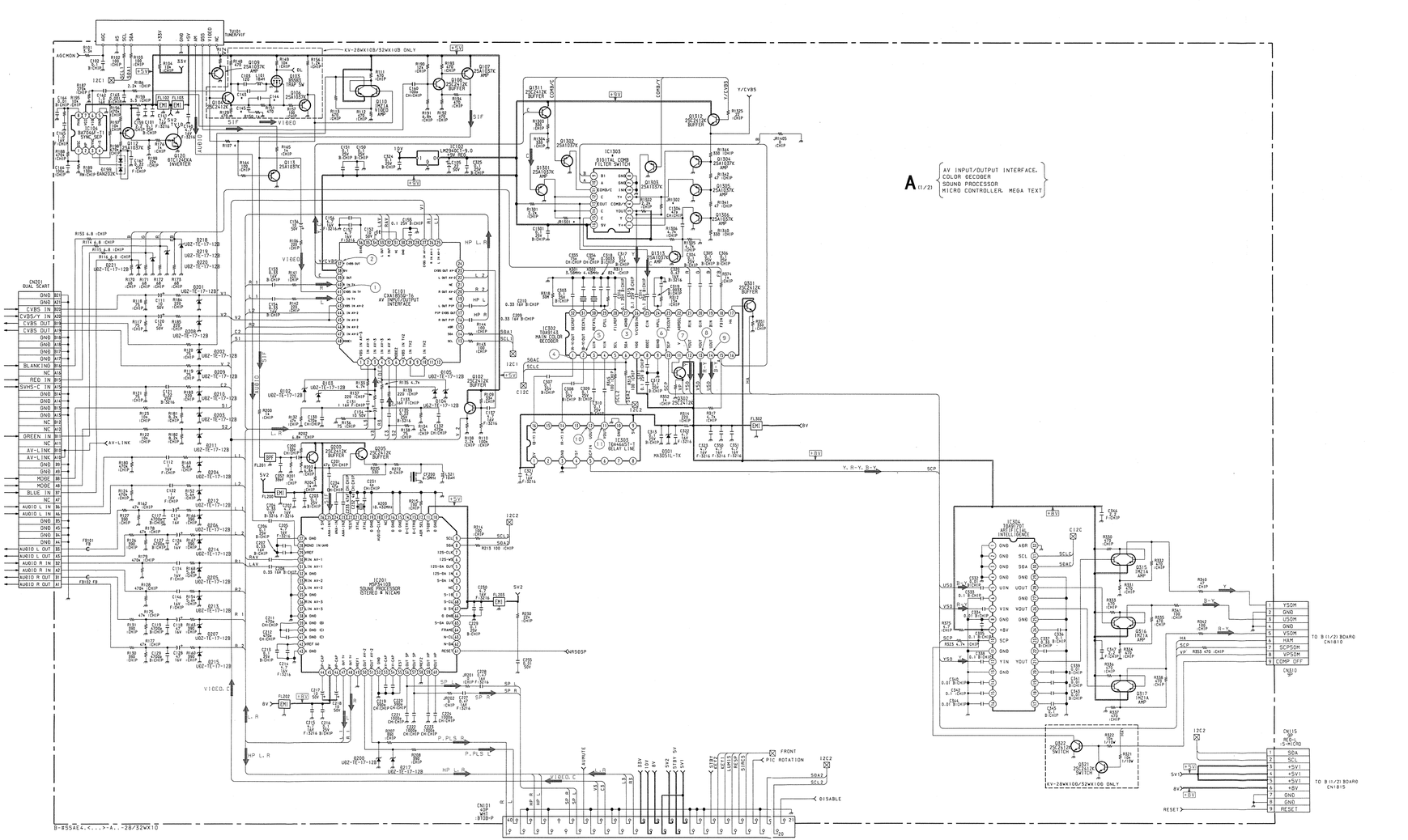
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTABLE RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- : B+ bus.
- : signal path. (RF)

A BOARD

IC		Q1311	G-22
IC101	E-22	Q1312	F-22
IC102	H-4	Q1313	G-3
IC104	C-19	Q2005	D-6
IC201	G-19	Q2006	B-15
IC302	H-3	Q2007	B-15
IC303	I-22	DIODE	
IC304	H-3	D102	G-9
IC1001	F-14	D103	E-4
IC1002	G-10	D104	F-4
IC1003	C-10	D105	G-9
IC1004	E-11	D199	C-19
IC1101	I-10	D200	H-7
IC2001	C-17	D201	E-2
IC2004	B-19	D202	D-2
		D203	F-3
TRANSISTOR		D204	H-2
Q102	E-23	D205	F-3
Q103	C-18	D206	H-8
Q104	D-8	D207	H-8
Q106	D-7	D208	E-2
Q107	D-9	D209	E-2
Q108	C-10	D210	E-3
Q109	D-7	D211	F-2
Q110	E-22	D212	G-2
Q112	B-19	D213	G-2
Q120	C-11	D214	F-3
Q200	G-8	D215	F-2
Q205	F-9	D217	H-7
Q301	H-4	D218	G-1
Q302	I-22	D219	H-1
Q315	H-23	D220	H-1
Q316	I-24	D221	G-1
Q317	I-24	D223	E-2
Q318	H-22	D301	H-22
Q321	I-2	D1007	C-10
Q322	H-2	D1008	C-14
Q1001	C-9	D1009	C-11
Q1011	C-14	D1010	C-11
Q1101	G-11	D2001	C-8
Q1301	H-22		
Q1304	G-21		
Q1305	G-21		
Q1306	G-22		



A (1/2) BOARD IC VOLTAGE TABLE

IC Voltage Table					
Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC201	4	0.5	IC1201	4	4.7
	5-6	4.7		13	4.7
	7	2.4		31	4.7
	8-9	4.7		35	4.7
	20	2.4		37	2.7
	24	4.4		39	2.2
	25	8.8		40	2.7
	26	4.4		41	4.7
	28	3.8		45	4.8
	29	2.7		29	2.7
	30-31	3.8		30-31	3.8
	39-42	3.8		39-42	3.8
	44	6.2		44	6.2
	45	8.0		45	8.0
	46	7.0	IC1303	1	5.0
	47-48	3.8		5	0.6
	50-51	3.7		11-12	3.0
	53-54	3.8		14	1.4
	56-57	1.2		16	1.2
	61	4.8	IC1401	1-2	2.0
IC302	1-2	2.0		3-4	2.4
	3-4	2.4		5	3.5
	5	3.0		6	4.0
	6	4.0		7	7.8
	7	8.0		8	5.0
	8	5.0		10	0.8
	10	0.5		12	2.4
	12	3.2		13-14	2.6
	13-14	2.6		15	8.0
	15	8.0		17	0.3
	17	0.3		22	7.8
	19	1.6		24	3.6
	21	1.0		26	3.3
	23-24	4.0		28	3.5
	26	3.7		29	4.3
	28	3.5		30	2.6
	29	5.0		31	2.6
	30	2.5		32	3.8
	31	2.5			
	32	2.0			

WAVEFORMS A BOARD

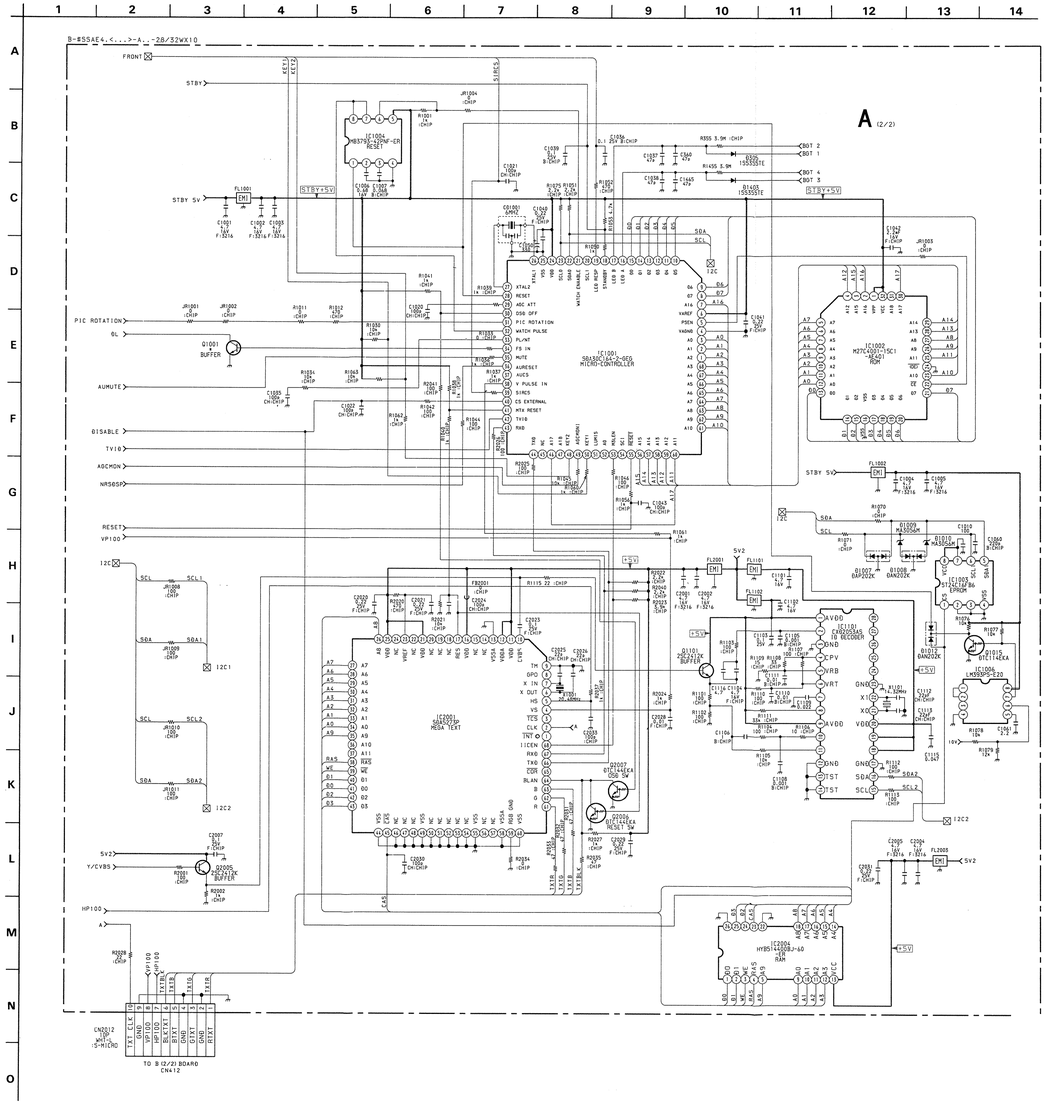
① PAL 1.0 Vp-p (H)	① SECAM 1.0 Vp-p (H)	② PAL 2.0 Vp-p (H)
② SECAM 2.0 Vp-p (H)	③ PAL 1.0 Vp-p (H)	③ SECAM 1.2 Vp-p (H)
④ 0.6 Vp-p (H)	⑤ 0.7 Vp-p (H)	⑥ 4.5 Vp-p (H)
⑦ 1.0 Vp-p (H)	⑧ 1.0 Vp-p (H)	⑨ 1.4 Vp-p (H)
⑩ 1.5 Vp-p (H)	⑪ 1.0 Vp-p (H)	

A (1/2) BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q102	1.9	4.7	1.3
Q105	0.08	4.5	0.08
Q107	4.4	1.7	5.0
Q108	1.8	4.4	1.2
Q112	4.3	4.9	5.0
Q120	4.6	0.1	0.1
Q301	0.5	8.0	0.4
Q302	-	8.0	0.3
Q318	0.1	5.2	0.1
Q1201	8.6	5.0	9.2
Q1202	0.7	5.0	9.2
Q1301	1.9	-	0.2
Q1302	-	-	0.6
Q1303	0.8	-	1.5
Q1304	2.2	-	0.1
Q1305	2.0	-	0.1
Q1306	1.7	-	-
Q1307	-	3.4	0.1
Q1308	3.5	4.7	2.9
Q1309	0.9	0.1	1.6
Q1310	1.0	0.1	1.6
Q1311	4.5	9.0	3.9
Q1312	4.5	9.0	-
Q1313	4.6	0.7	0.1
Q1314	4.8	4.7	4.3
Q1404	4.5	7.8	3.8
Q1411	0.5	8.0	0.6
Q1412	0.1	8.0	0.1
Q1201	2.6	8.6	2.1
Q1202	2.6	8.6	2.1

A BOARD * MARK

Ref	KV-28WX10B	KV-28WX10D	KV-32WX10B	KV-32WX10D
IC1303	–	MC14052BDR2	–	MC14052BDR2
JR1301	O : CHIP	–	O : CHIP	–
JR1302	O : CHIP	–	O : CHIP	–
Q1001	2SC2412K	–	2SC2412K	–
R107	–	O : CHIP	–	O : CHIP



A (2/2) BOARD IC VOLTAGE TABLE

IC Voltage Table

Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC101	1-5	4.6	IC1101	1	4.8
	7-6	4.6		2	1.1
	10	4.6		4	0.9
	17	4.6		5	0.3
	23	4.6		6-7	2.4
	29	4.6		8	1.4
	31	4.6		9	4.7
	34	4.6		10	1.7
	36	4.6		11	1.5
	38	9.0		16	4.0
	40-47	4.6		18-20	4.7
IC1001	5	2.4		21	2.5
	6	4.8		22	2.3
	19	3.6	IC2001	2	0.4
	20	0.1		5	0.3
	24	4.8		6-7	1.6
	26	2.1		8	4.0
	27	2.3		10	1.0
	28	4.6		11-12	4.7
	30	0.1		16	4.7
	31-32	2.4		21	4.7
	33	4.8		23	2.9
	36	4.1		25	4.7
	38	0.1		66	4.7
	39	0.6		68	4.7
	40	4.8			
	41	0.1			
	42	4.8			
	43	4.4			
	44	4.1			
	48	4.8			
	49	2.2			
	50	4.8			
	52	4.8			
	54	4.8			

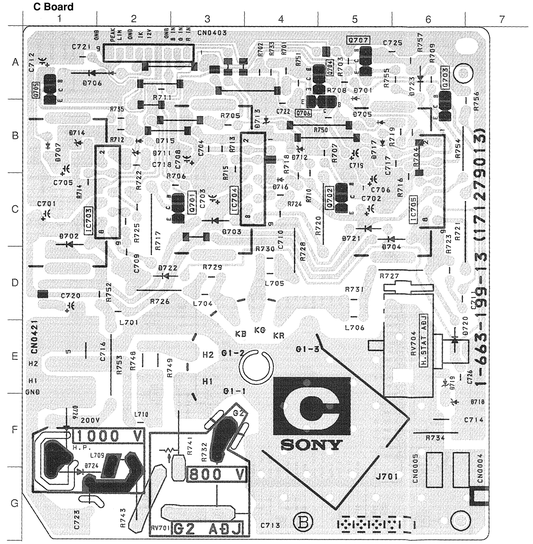
A (2/2) BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table

Ref No	B Base	C Collector	E Emitter
Q1001	0.1	0.7	0.1
Q1004	0.1	0.7	-
Q1101	3.3	5.0	2.6

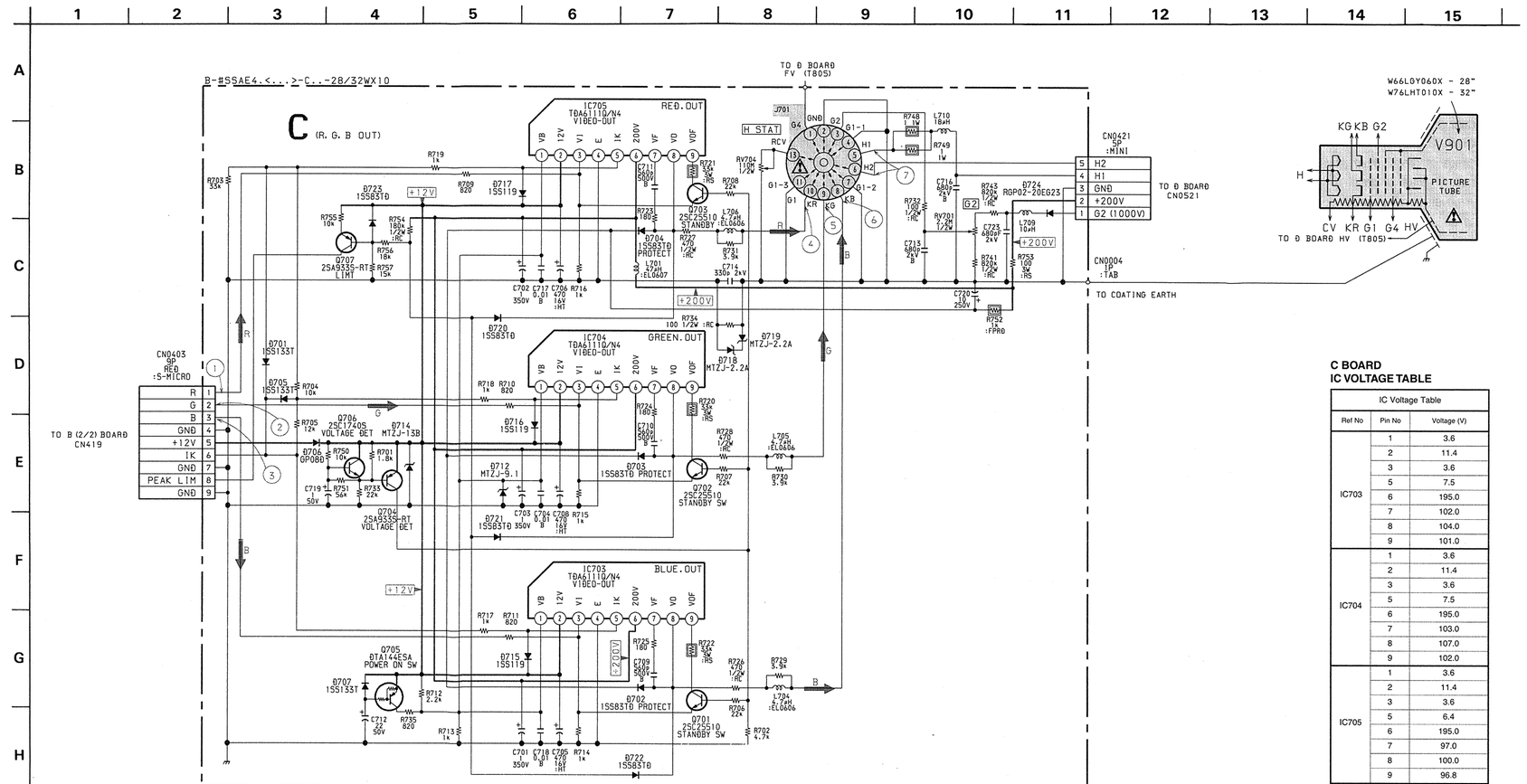
C [RGB OUT]

C Board



C BOARD

IC	
IC703	C-1
IC704	C-3
IC705	C-6
TRANSISTOR	
Q701	C-3
Q702	C-5
Q703	A-6
Q704	A-5
Q705	A-1
Q706	B-4
Q707	A-5
DIODE	
D701	A-5
D702	C-1
D703	C-3
D704	C-6
D705	B-5
D706	A-1
D707	B-1
D712	B-4
D714	B-1
D715	B-2
D716	C-4
D717	B-6
D718	F-6
D719	E-6
D720	E-6
D721	C-5
D722	D-2
D723	A-6
D724	F-1
VARIABLE RESISTOR	
RV701	G-1
RV704	E-6



WAVEFORMS C BOARD

① 2.0 Vp-p (2H)	② 2.0 Vp-p (2H)	③ 2.0 Vp-p (2H)
④ 107 Vp-p (2H)	⑤ 95 Vp-p (2H)	⑥ 100 Vp-p (2H)
⑦ 30 Vp-p (2H)		

C BOARD IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC703	1	3.6
	2	11.4
	3	3.6
	5	7.5
	6	195.0
	7	102.0
	8	104.0
	9	101.0
IC704	1	3.6
	2	11.4
	3	3.6
	5	7.5
	6	195.0
	7	103.0
	8	107.0
	9	102.0
IC705	1	3.6
	2	11.4
	3	3.6
	5	6.4
	6	195.0
	7	97.0
	8	100.0
	9	96.8

C BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q701	4.2	3.7	3.6
Q702	4.2	3.7	3.6
Q703	4.2	3.7	3.6
Q704	10.7	11.2	11.3
Q705	11.3	3.6	11.3
Q706	11.3	11.3	10.7
Q707	11.8	9.8	11.3

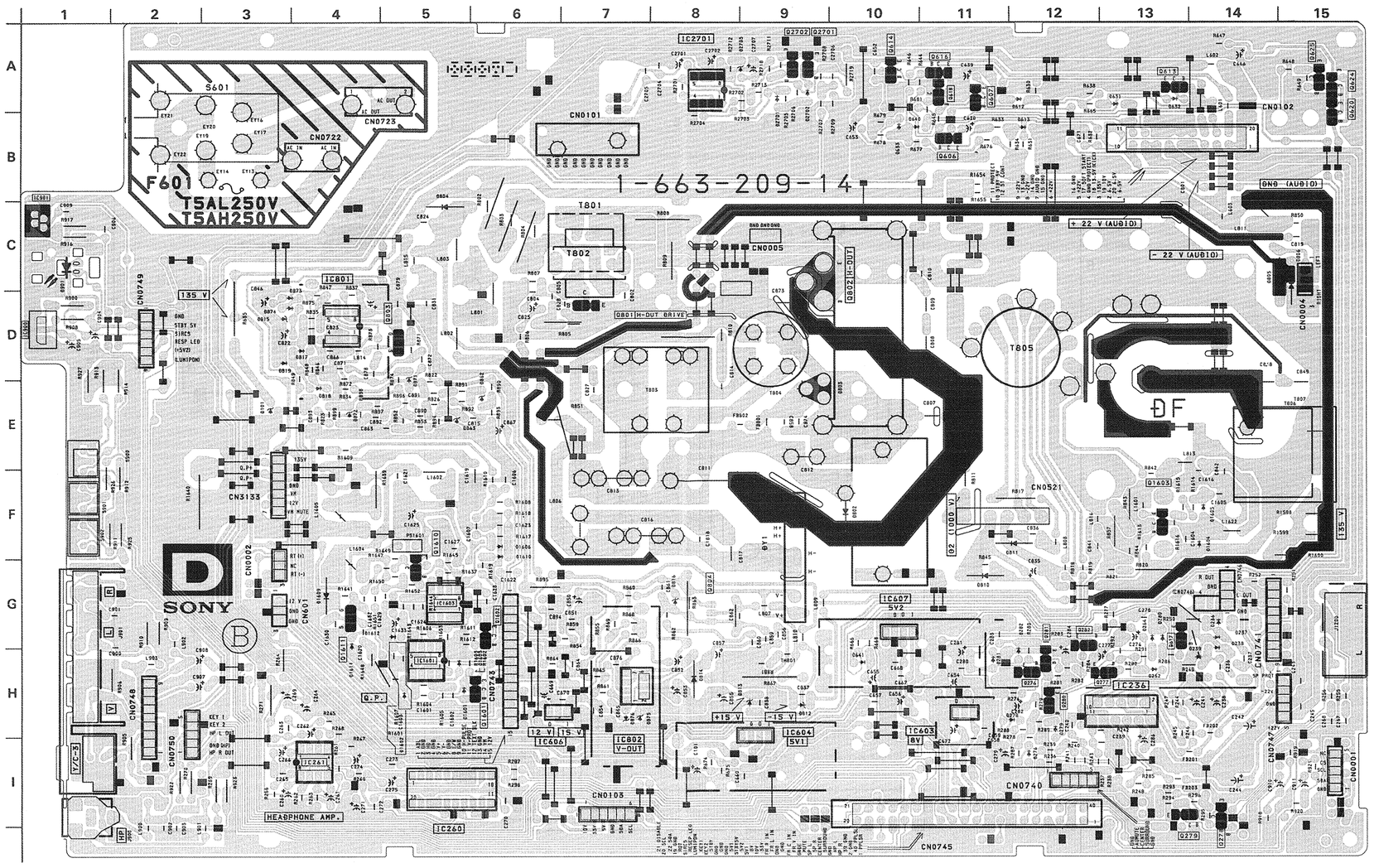
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

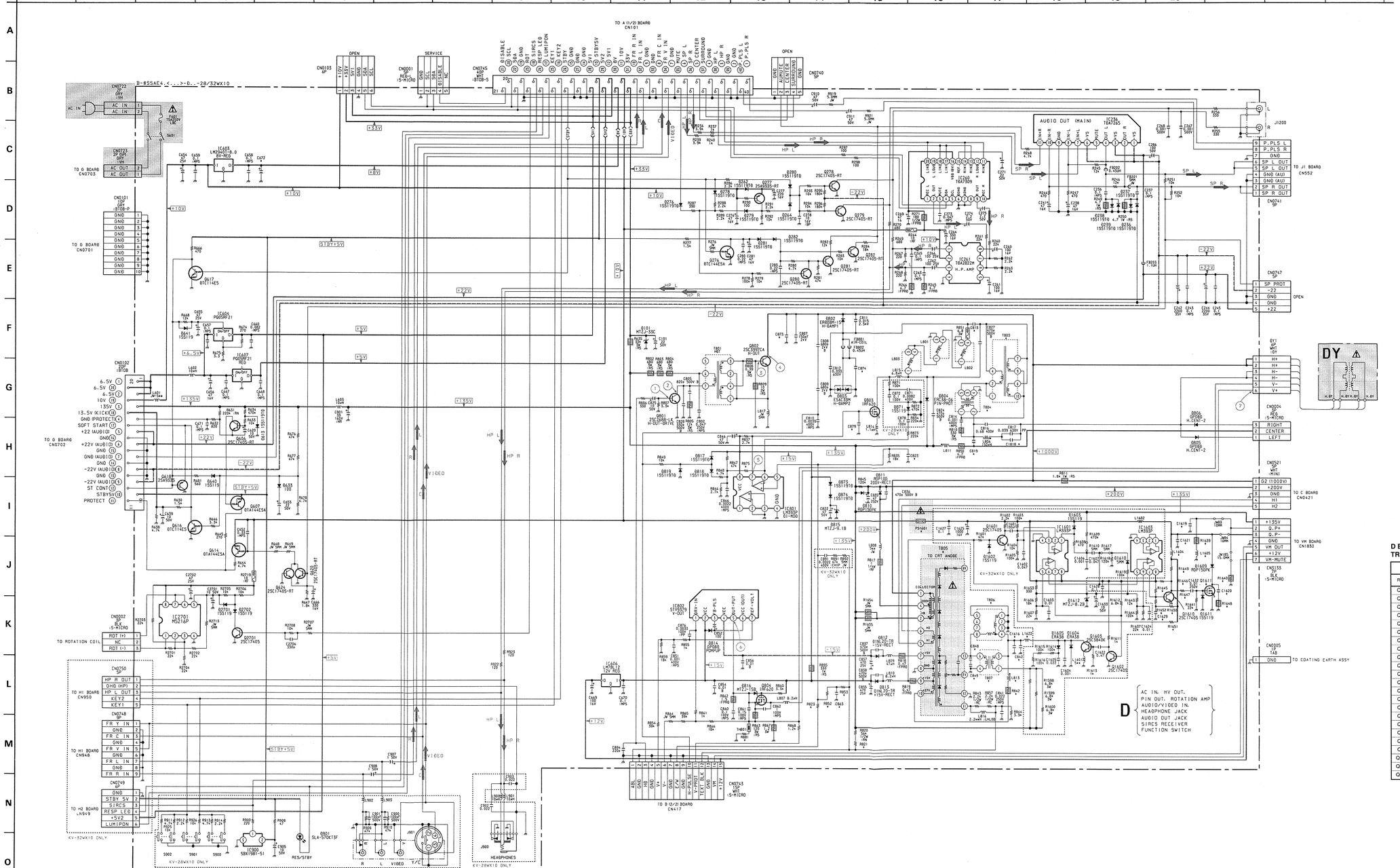
D BOARD

IC		DIODE	
IC236	H-13	D101	E-3
IC260	I-5	D236	G-14
IC261	I-4	D237	G-14
IC603	H-11	D238	G-14
IC604	H-9	D239	G-14
IC606	H-7	D262	H-13
IC607	G-10	D264	G-13
IC801	C-4	D276	I-12
IC802	H-8	D278	H-12
IC1601	H-5	D279	H-12
IC1603	G-5	D280	G-13
IC2701	A-8	D281	H-12
TRANSISTOR		D282	G-12
Q276	H12	D612	A-12
Q277	H-13	D613	B-12
Q278	I-14	D631	A-13
Q279	I-14	D632	A-14
Q280	H-12	D633	B-11
Q281	G-12	D802	F-10
Q282	G-13	D803	E-10
Q606	B-11	D804	B-5
Q607	A-11	D805	C-15
Q613	A-13	D806	C-15
Q614	A-10	D810	G-11
Q616	A-11	D811	F-12
Q617	G-13	D812	H-9
Q618	A-11	D813	H-9
Q620	A-15	D814	H-8
Q624	A-15	D815	D-3
Q801	D-7	D816	G-8
Q802	C-10	D817	D-4
Q803	D-5	D818	E-4
Q804	G-8	D819	D-3
Q1601	H-6	D871	D-5
Q1602	G-6	D873	D-4
Q1603	F-13	D874	D-3
Q1610	F-5	D1602	H-5
Q1611	G-4	D1603	H-6
Q2701	A-9	D1604	F-14
		D1605	F-14
		D1609	G-4
		D1611	H-4
		D2701	A-9
		D2702	A-9

D [AC IN, HV OUT, PIN OUT, ROTATION AMP, AUDIO OUT JACK, SIRCS RECEIVER,FUNCTION SW]

D Board





WAVEFORMS D BOARD

① 3.5 Vp-p (2H)	② 210 Vp-p (2H)	③ 11 Vp-p (2H)
④ 1.1K Vp-p (2H)	⑤ 10 Vp-p (2H)	⑥ 62 Vp-p (2H)
⑦ 100 Vp-p (2H)		

D BOARD * MARK

Ref	KV-28WX10B KV-28WX10D	KV-32WX10B KV-32WX10D
C672	–	47mF 16V
C813	0.68mF 400V	0.82mF 400V
C819	0.022MF 250V	0.033mF 250V
C823	0.01mF 50V	0.1mF 50V
C842	0.0047mF 400V	–
C848	–	150pF 2KV
C849	–	150pF 2KV
C863	–	0.1mF 50V
C873	–	330pF 2KV
C874	1000pF 500V	0.0047mF 630V
C879	–	100pF 50V
C1616	–	0.0018mF 630V
C1619	0.1mF 100V	0.018mF 630V
C1620	JW 5MM	220pF 50V
C1621	0.01mF 400V	0.0047mF 630V
C1629	0.0068mF 50V	–
C1818	–	0.0027mF 630V
L813	10mmh	–
L1604	6.8mmh	–
L1605	6.8mmh	Coil
L1622	3.3mmh	4.7mmh
PS1601	JW 5MM	Link IC
Q1611	2SC4793	IRF620
R821	6.8K 1/4W	JW 5MM
R823	1.8K 1/4W	3.3K 1/4W
R842	33 1/4W	–
R852	390K 1/4W	180K 1/4W
R853	220K 1/4W	180K 1/4W
R875	3.3K 1/4W	JW 5MM
R881	4.7 1/4W	22 1/4W
R1639	–	220 2W
R1640	–	1.5K 3W
R1645	68K 1/4W	4.7K 1/4W
R1646	2.2K 1/4W	680 1/4W
R1647	JW 5MM	560 1/4W
R1648	10K 1W	JW 5MM
R1649	10K 1/4W	–
R1650	10K 1/4W	–
R1651	33 1/4W	–
R1652	2.2K 1/4W	–
T805	NX-4003	NX-4123
T806	Ferrite (DFT)	–
T807	–	Ferrite (DFT)

D BOARD TRANSISTOR VOLTAGE TABLE

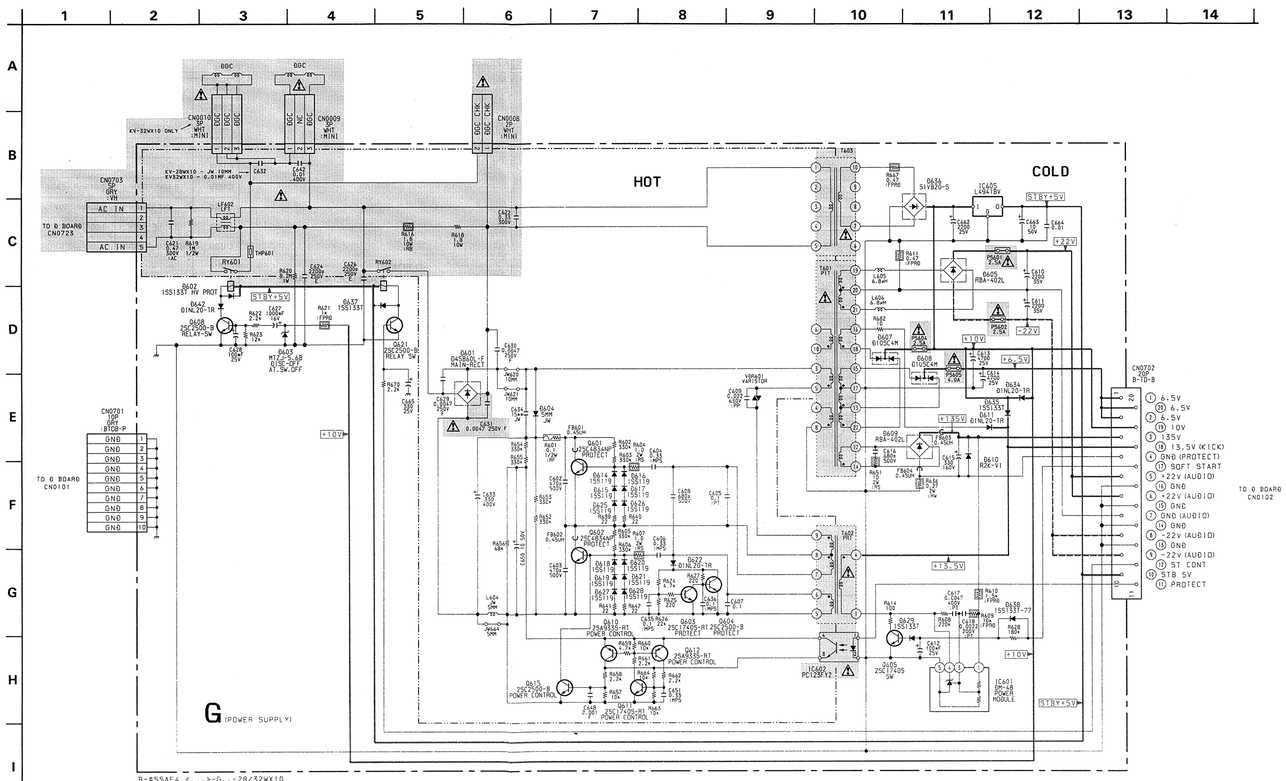
Transistor Voltage Table

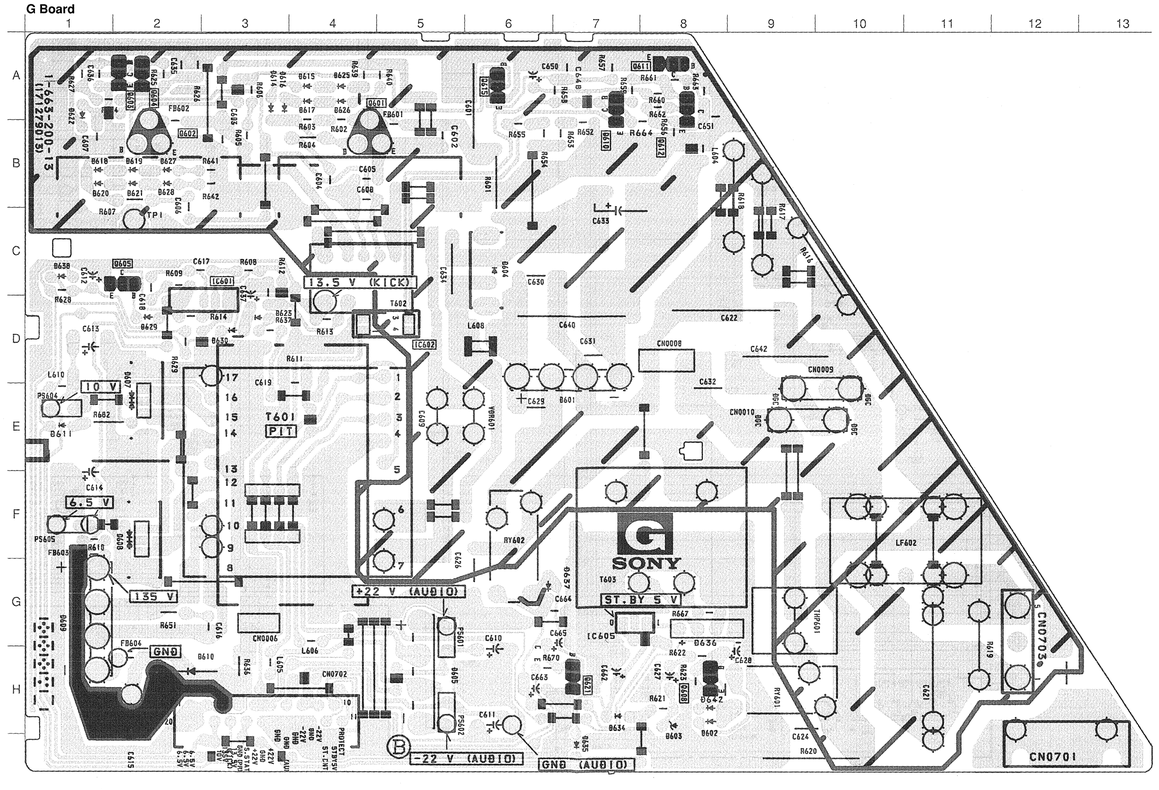
Ref No	B Base	C Collector	E Emitter
Q276	0.7	4.0	-
Q277	10.0	-	9.7
Q278	-1.3	-	
Q279	-1.3	-	-1.3
Q280	0.4	0.7	-
Q281	0.7	-	-
Q282	0.7	-	-
Q801	-1.0	101.0	-
Q802	-	136.0	-
Q803	9.0	15.0	-
Q804	11.3	0.1	-1.3
Q606	0.5	4.8	0.3
Q607	4.8	1.6	4.8
Q613	13.5	-	-
Q614	10.0	9.0	10.0
Q616	0.7	-	-
Q617	0.7	3.5	-
Q618	3.5	-	-
Q620	-	10.0	-
Q624	-	10.0	-
Q2701	-	2.3	-
Q1610	-0.5	2.2	-
Q1611	0.2	43.4	-

G BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q601	-1.6	-	-
Q602	0.2	293.0	-
Q603	0.6	0.1	-
Q604	0.1	1.4	-
Q605	0.1	11.0	-0.1
Q608	-	4.8	-0.1
Q610	22.0	-2.3	26.8
Q611	-1.6	26.6	-
Q612	26.7	-1.1	26.8
Q615	-2.6	-1.5	-
Q621	0.6	-	-0.1

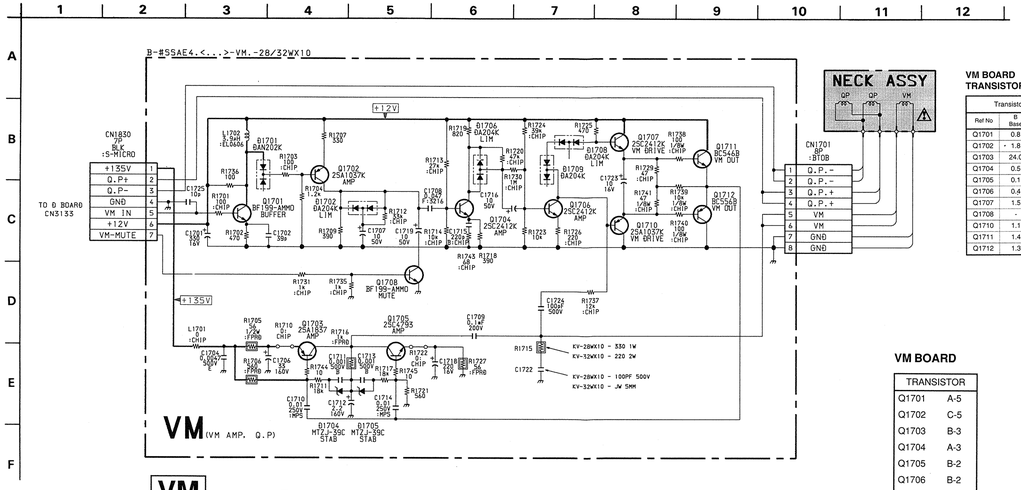
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.





G BOARD

IC	
IC601	C-3
IC602	D-5
IC603	G-7
TRANSISTOR	
Q601	A-5
Q602	B-2
Q603	B-2
Q604	B-2
Q605	C-1
Q608	H-8
Q610	B-7
Q611	A-8
Q612	B-8
Q615	A-6
Q621	H-7
DIODE	
D601	E-7
D602	H-8
D603	H-8
D605	H-5
D607	E-2
D608	F-2
D609	G-1
D610	H-3
D611	E-1
D614	A-3
D615	A-4
D616	A-3
D617	A-4
D618	B-1
D619	B-2
D620	B-1
D621	B-2
D622	A-1
D623	D-3
D625	A-4
D626	A-4
D627	B-2
D628	B-2
D629	D-2
D630	D-3
D633	G-7
D634	H-7
D636	G-8



VM BOARD TRANSISTOR VOLTAGE TABLE

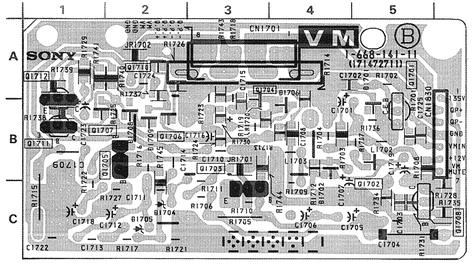
Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q1701	0.8	0.7	2.1
Q1702	- 1.8	0.2	1.9
Q1703	24.0	13.3	24.0
Q1704	0.5	1.2	0.4
Q1705	0.1	12.3	-
Q1706	0.4	1.1	0.3
Q1707	1.5	2.1	1.4
Q1708	-	-	-
Q1710	1.1	-	1.2
Q1711	1.4	2.1	1.3
Q1712	1.3	1.2	-

VM BOARD

TRANSISTOR	
Q1701	A-5
Q1702	C-5
Q1703	B-3
Q1704	A-3
Q1705	B-2
Q1706	B-2
Q1707	B-1
Q1708	C-6
Q1710	A-2
Q1711	B-1
Q1712	A-1
DIODE	
D1701	A-5
D1702	C-4
D1704	C-2
D1705	C-2
D1706	A-4
D1708	B-2
D1709	B-2

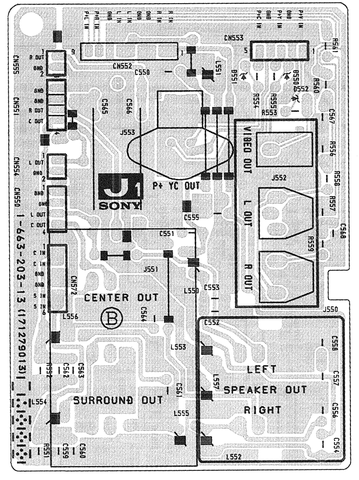
VM [VM OUT, Q.P]

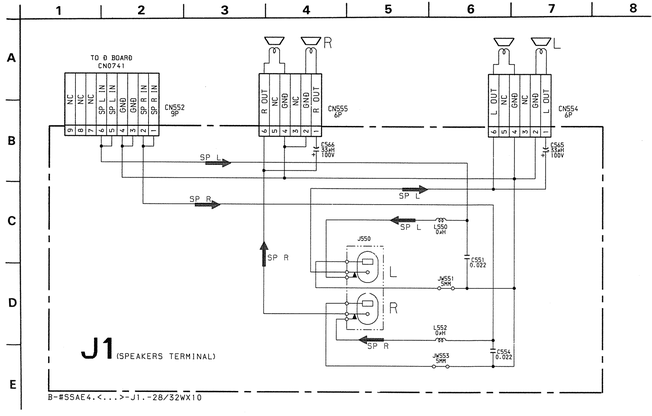
VM Board



J1 [SPEAKERS TERMINAL]

J1 Board



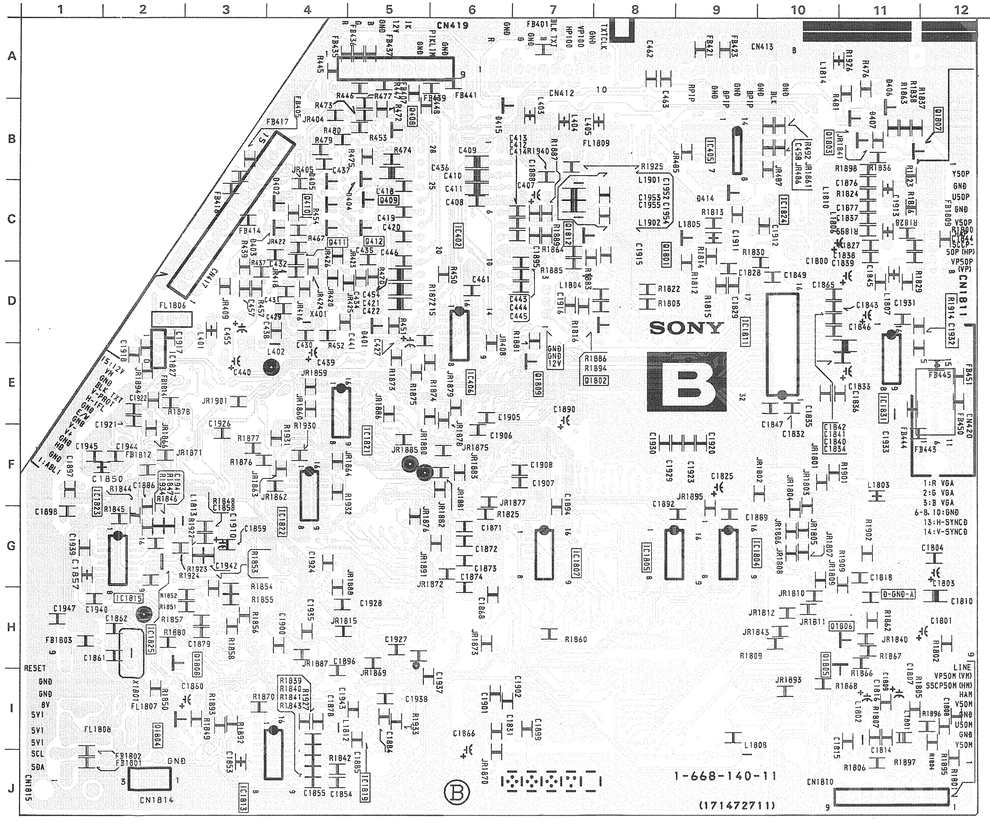


B A/D, D/A CONVERTER, DIGITAL NOISE REDUCER, CRT DRIVER, DEFLECTION PROCESSOR

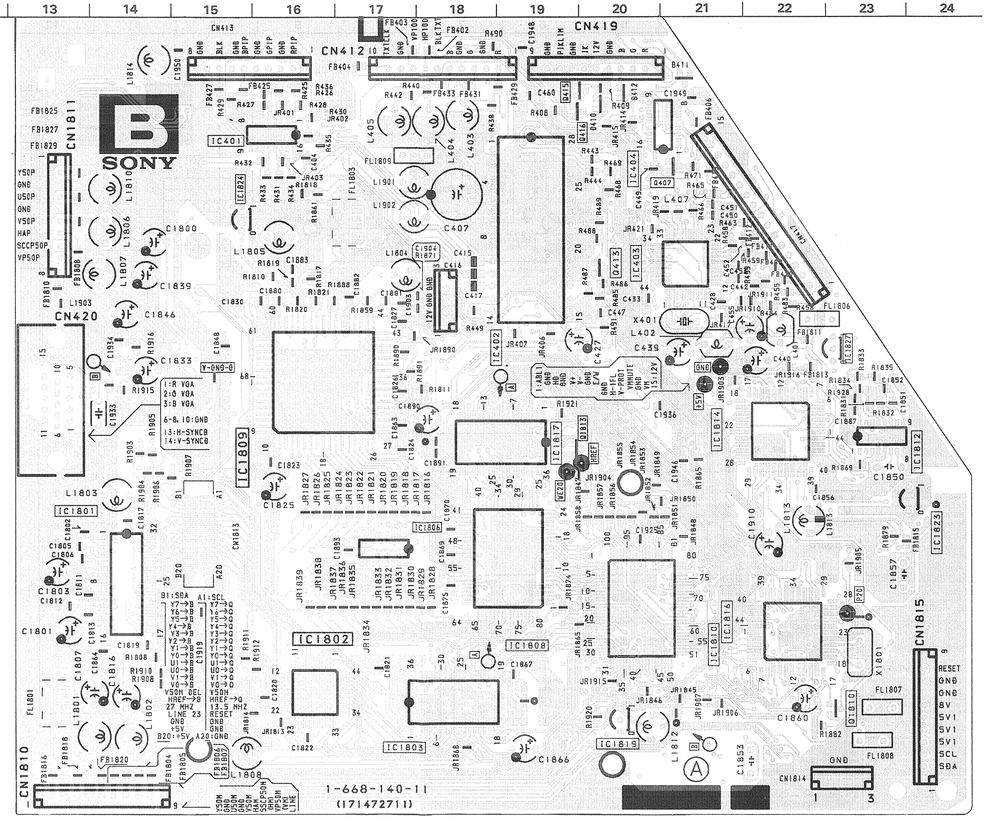
B BOARD

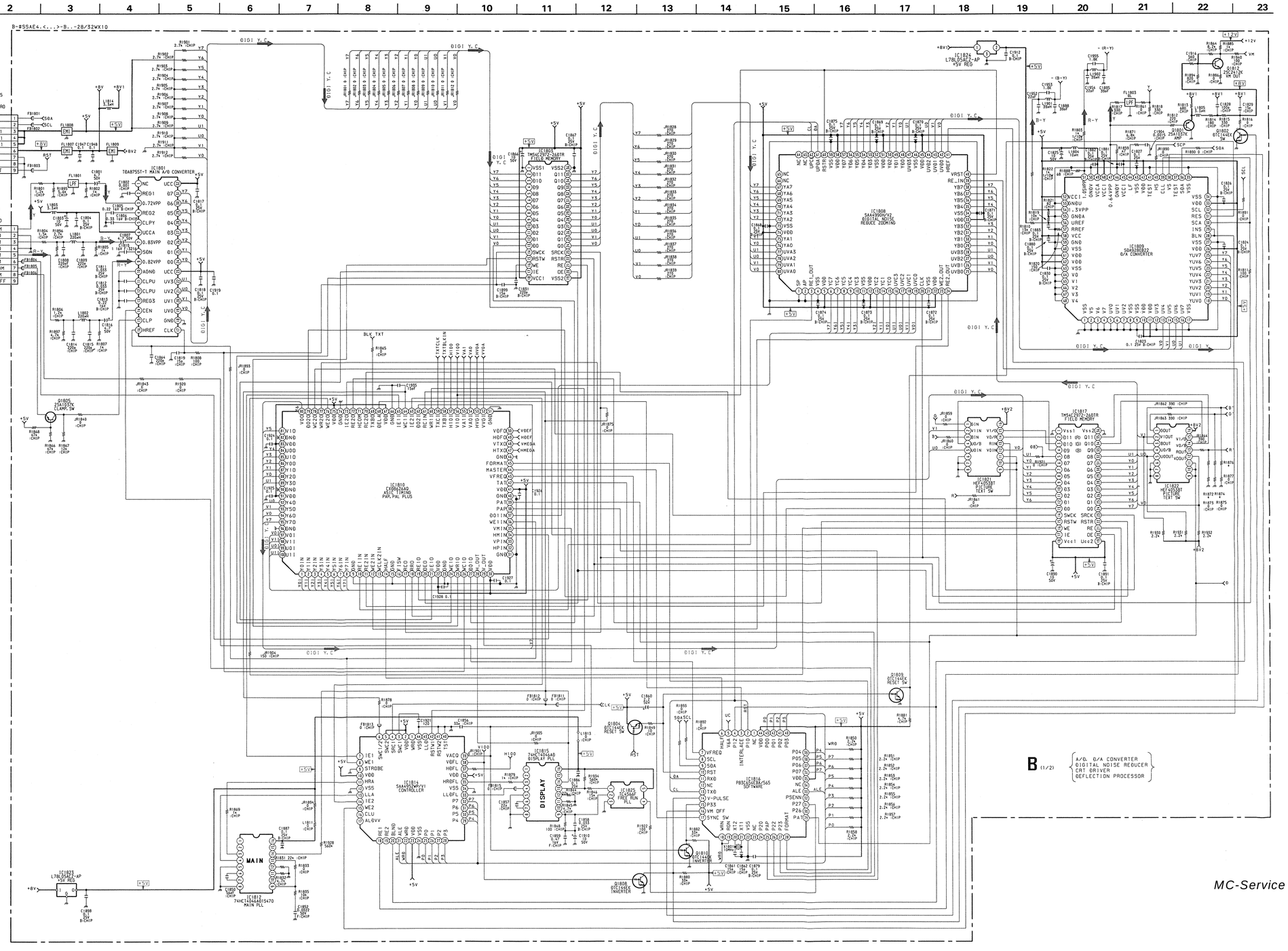
IC		TRANSISTOR	
IC402	C-6	Q411	C-4
IC403	D-20	Q412	C-5
IC405	B-9	Q415	A-19
IC406	E-6	Q416	B-20
IC1801	G-13	Q1801	C-8
IC1803	I-17	Q1802	D-8
IC1808	H-19	Q1804	I-2
IC1809	E-15	Q1805	H-10
IC1810	I-21	Q1808	H-2
IC1812	F-24	Q1809	E-7
IC1814	F-21	Q1810	I-23
IC1815	H-2	Q1812	C-8
IC1816	H-22		
IC1817	E-19	DIODE	
IC1821	F-5	D401	D-5
IC1822	G-4	D402	C-3
IC1823	F-1	D403	C-3
IC1824	C-10	D410	B-20
		D411	A-21
		D412	A-20
		D414	C-9
		D415	B-7

B Board < Conductor Side >



B Board < Component Side >





B BOARD * MARK

Ref	KV-28WX10B	KV-28WX10D	KV-32WX10B	KV-32WX10D
C442	0.039mF 25V	0.039mF 25V	–	–
C457	0.01mF 50V	0.01mF 50V	–	–
JR409	1K 1/10W	1K 1/10W	O : CHIP	O : CHIP
R1872	82 1/10W	82 1/10W	100 1/10W	100 1/10W
R1874	82 1/10W	82 1/10W	100 1/10W	100 1/10W
R1876	82 1/10W	82 1/10W	100 1/10W	100 1/10W

B (1/2) BOARD IC VOLTAGE TABLE

IC Voltage Table

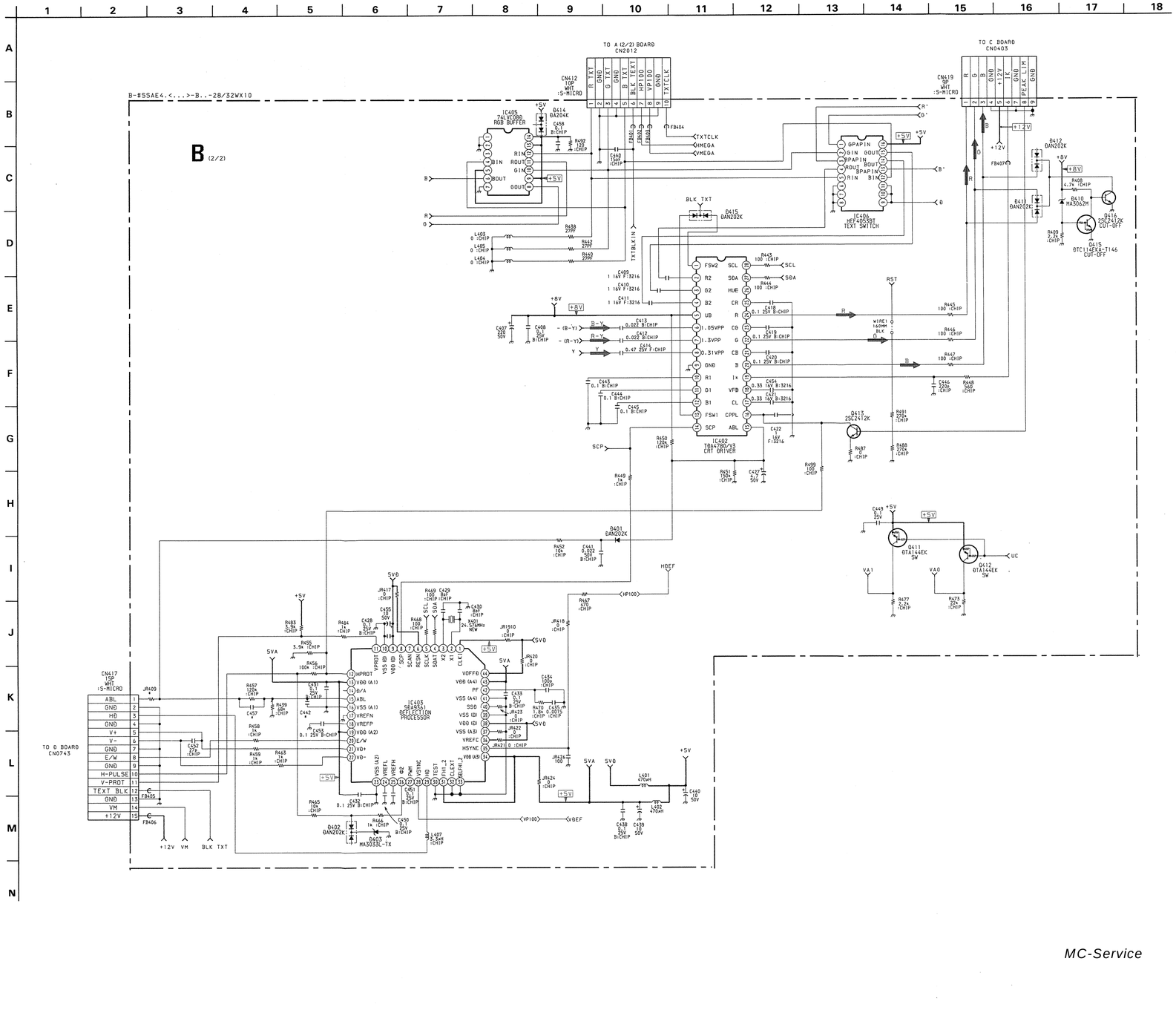
Ref No	Pin No	Voltage (V)
IC1812	3-4	2.4
	6-7	0.7
	9	4.6
	11-13	4.7
	14	0.3
	16	5.0
IC1813	3-4	2.4
	6-7	0.7
	9	4.6
	11-13	4.7
	14	0.3
	16	5.0
IC1815	1	5.0
	2	2.3
	3-4	2.5
	6-7	0.8
	9-11	3.0
	12	4.5
	13	3.0
	14	0.4
	15	0.2
	16	5.2
IC1821	2	2.5
	4-5	2.3
	12	2.0
	14	2.0
	15	2.6
	16	8.0
IC1822	2	2.9
	4-5	2.6
	12	2.3
	14	2.1
	15	2.8
	16	8.0

B BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table

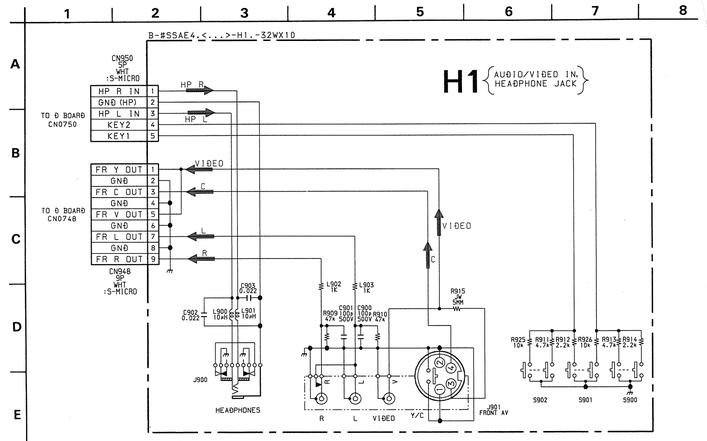
Ref No	B Base	C Collector	E Emitter
Q1411	0.1	4.8	4.8
Q1412	0.1	4.8	4.8
Q1415	1.8	0.1	-
Q1416	0.1	5.6	-
Q1801	0.1	-	0.9
Q1802	4.0	0.1	0.1
Q1804	0.3	4.8	0.1
Q1805	2.5	1.3	0.7
Q1807	2.5	1.3	0.7
Q1808	0.1	4.7	0.1
Q1809	0.1	0.1	0.1
Q1810	0.1	4.8	-
Q1812	0.5	10.5	-
Q1813	0.1	3.7	0.1

MC-Service



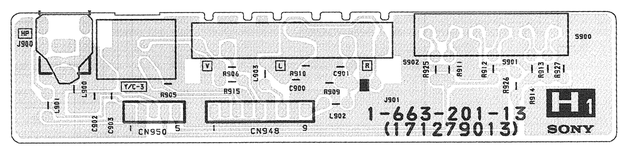
B (2/2) BOARD IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC402	2-4	5.0
	5	7.8
	6-7	4.0
	8	3.7
	10-12	5.0
	14	0.7
	16	4.7
	17	5.1
	18	1.8
	19	7.5
	20	2.5
	21	3.3
	22	2.8
	23	3.3
	24	2.9
	25	3.3
	27	4.0
	28	3.8
IC405	5	3.2
	9	3.2
	13-14	3.2
IC406	16	4.8

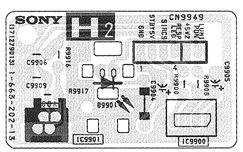


H1 [AUDIO/VIDEO IN, HEADPHONE JACK] **H2** [REMOTE RECEIVER]

H1 Board

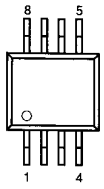


H2 Board



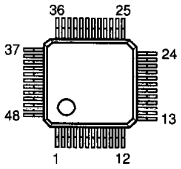
5-4. SEMICONDUCTORS

BA7046F
BA7046F-T1
MB3793-42PNF
MB3793-42PNF-ER



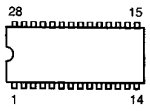
(TOP VIEW)

CXA1855Q-T6



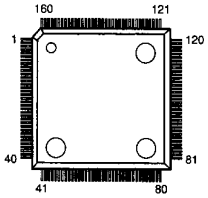
(TOP VIEW)

CXD2053S
TDA4780/V3



(TOP VIEW)

CXD8624Q



(TOP VIEW)

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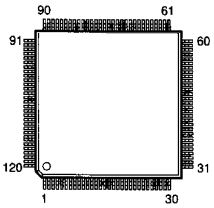
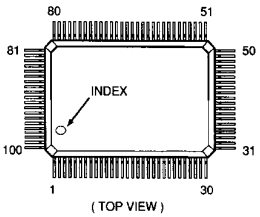


(TOP VIEW)

CXD8626Q



(TOP VIEW)

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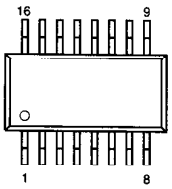
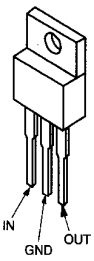
MC74F157ADR2
74HCT4046AD/S470

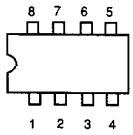


(TOP VIEW)

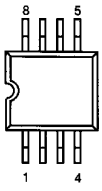
LM2940CT-9.0
LM2940T-8.0
LM2940T-9.0
L4941BV
TEA7605



LM393P
M5216P
ST24C16FB6
TDA2822M
UPC393C

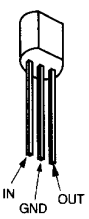


LM393PS

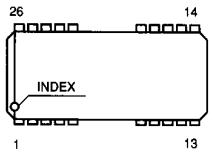


(TOP VIEW)

LM78L05ACZ
LM78L12ACZ
L78L05ACZ-AP
L78L12ACZ-AP

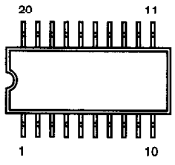


MB814400C-70PJN-ER



(TOP VIEW)

MC74F240DWR2



(TOP VIEW)

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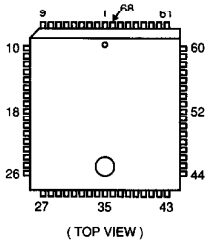
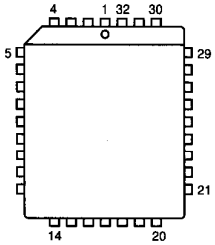
MSP3410B-PS-F7-T-ND
SDA30C164-2-GEG
SDA5275



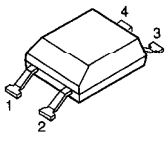
(TOP VIEW)

M27C4001-15C1-AE401

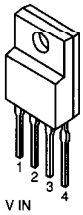


(TOP VIEW)

PC123F2
PC123FY2

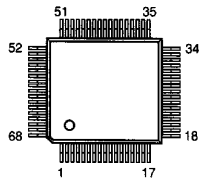


PQ05RF21



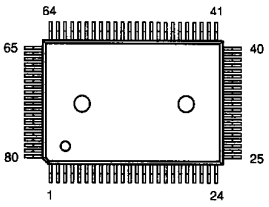
1 : V IN
2 : V OUT
3 : GND
4 : ON/OFF CONTROL

P83C654EBA/560
SDA9280A41



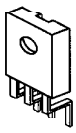
(TOP VIEW)

SAA4990H/V2

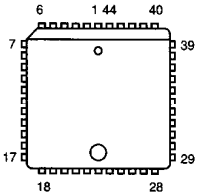


(MARKING SIDE VIEW)

SBX1981-51

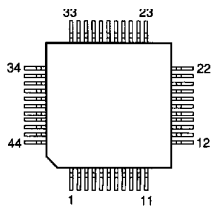


SAA4952WP/V1

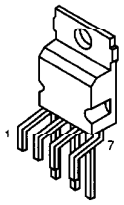


(TOP VIEW)

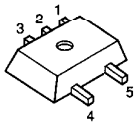
SDA9361



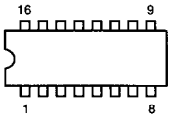
STV9379



TC4S66F
TC4S66F-TE85L

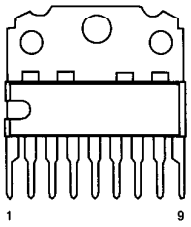


TDA4665T-T

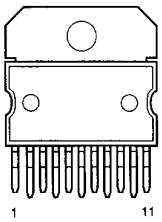


(TOP VIEW)

TDA6111Q
TDA6111Q/N4



TDA7265



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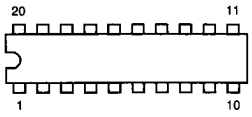
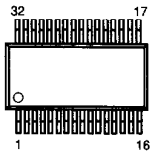


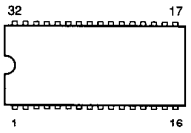
(TOP VIEW)

TDA8755T-T



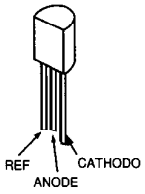
(TOP VIEW)

TDA9143/N2
TDA9144/N2
TDA9170T

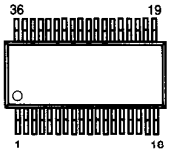


(TOP VIEW)

TL431CLP
TL431CLP-Z20
TL431CPS-T1
TL431CZ

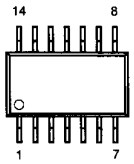


TMS4C2972-26DTR
TMS4C2972-28DTR



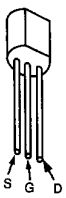
(TOP VIEW)

74LVC08D

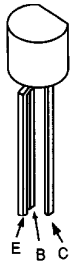


(TOP VIEW)

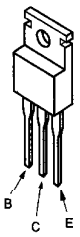
BC546B
BC556B



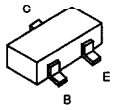
BF199
BF199-AMMO



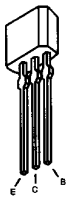
IRF620



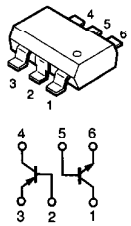
DTA144EK	DTC144EK
DTA144EK-T146	DTC144EK-T146
DTC114EK	DTC144EKA-T146
DTC114EKA-T146	2SA1037K-T-146-R
DTC123EK	2SA1162-G
DTC123EK-T146	2SC2412K-QR
DTC124EKA-T146	2SC2412K-T-146-R



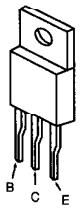
DTA144ESA	2SA933AS-RT
DTA144ESA-TP	2SA933S-RT
DTC114ESA-TP	2SC1740S-RT
DTC144ESA-TP	2SC2785-HFE
2SA1175-HFE	



IMZ1A-T109

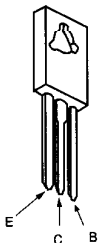


2SA1837

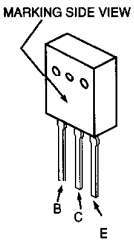


2SC2500-B
2SC2551-O
2SC2551O-TPE2

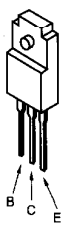
2SC2688-LK
2SC3840K



2SC3997CA

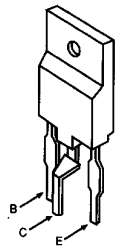


2SC4793

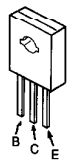


MC-Service

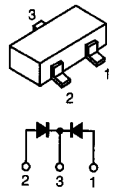
2SC4834NP-F09



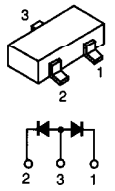
2SD2396H



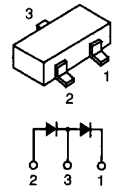
DAN202K
DAN202K-T-146



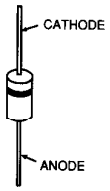
DAP202K
DAP202K-T-146



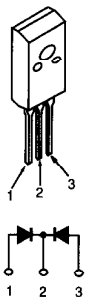
DA204K
DA204K-T-146



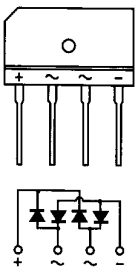
D1NL20-TR
EGP20G
EL1Z
GP08D
GP08DPKG23
MTZJ-T-77-9.1
MTZJ-T-77-9.1A
R2K-V1
RGP02-20EG23
RGP02-20EL-6394
RGP10GPKG23
RGP15GPKG23
S2LA20F
1SS133T-77
1SS83
1SS83TD



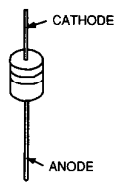
D10SC4M



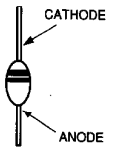
D4SB60L
D4SB60L-F
RBA-402L



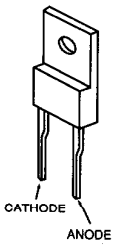
ERA38-06
ERA38-06TP1
MTZJ-T-77-13B
MTZJ-T-77-15B
MTZJ-T-77-2.2A
MTZJ-T-77-33C
MTZJ-T-77-39C
MTZJ-T-77-5.6B
MTZJ-T-77-8.2B
MTZJ-T-77-9.1B
MTZJ-13B
MTZJ-33C
MTZJ-39C
RD15ES-B2
RD5.6ESB2
RD8.2ESB2
RD9.1ESB2
1SS119-25
1SS119-25TD



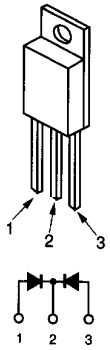
ERC38-06



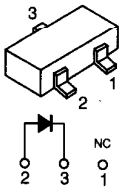
ERD08M-15



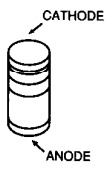
ESAC39M-06CF38
ESAD39M-06C



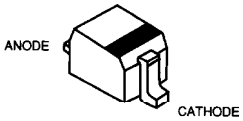
MA3030-H(TX)
MA3033-L
MA3033L-TX
MA3056M-TX
MA3062M-TX
RD5.6M-B2



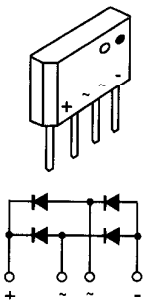
MA3051L-TX



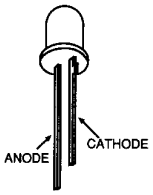
RD12SB2
UDZ-TE-17-12B



S1VB20-S
S1VB40

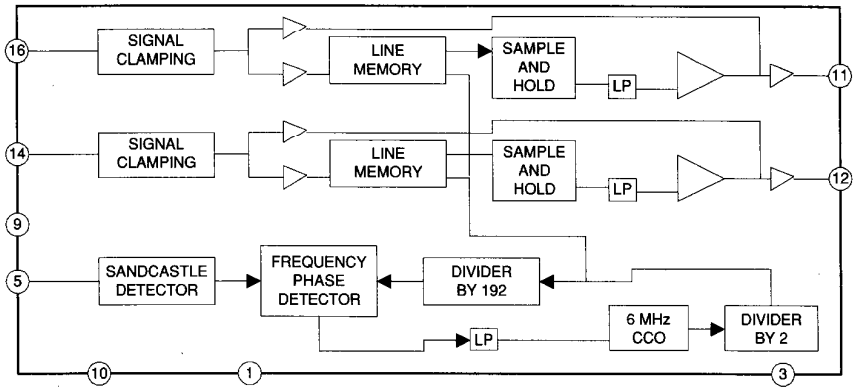


SLA-570KT3F

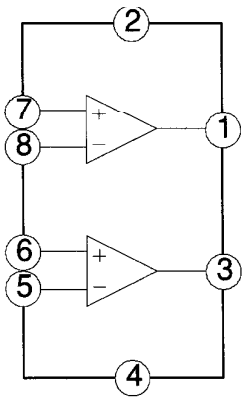


5-5. IC BLOCK DIAGRAMS

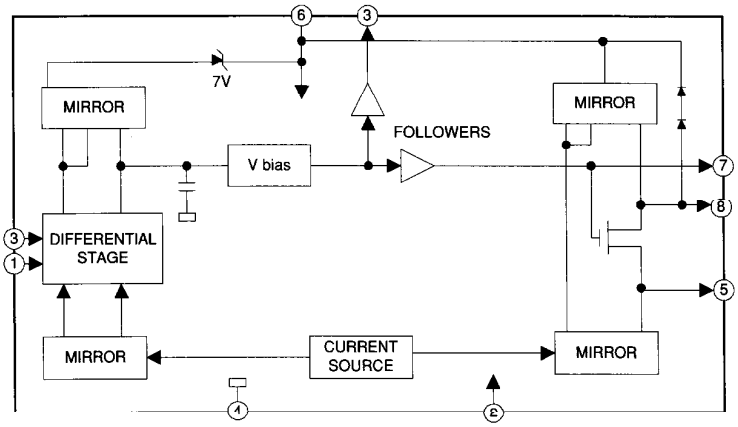
A BOARD IC303 TDA4665T-T



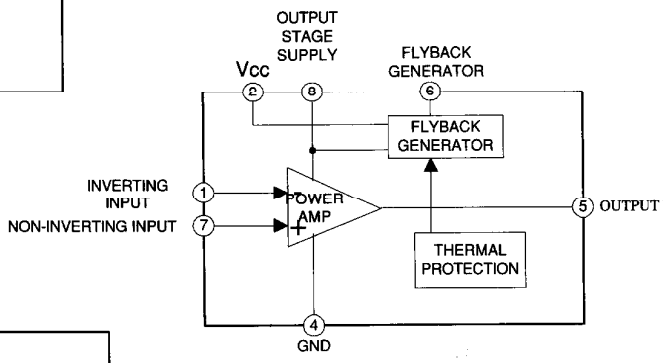
D BOARD IC261 TDA2822M



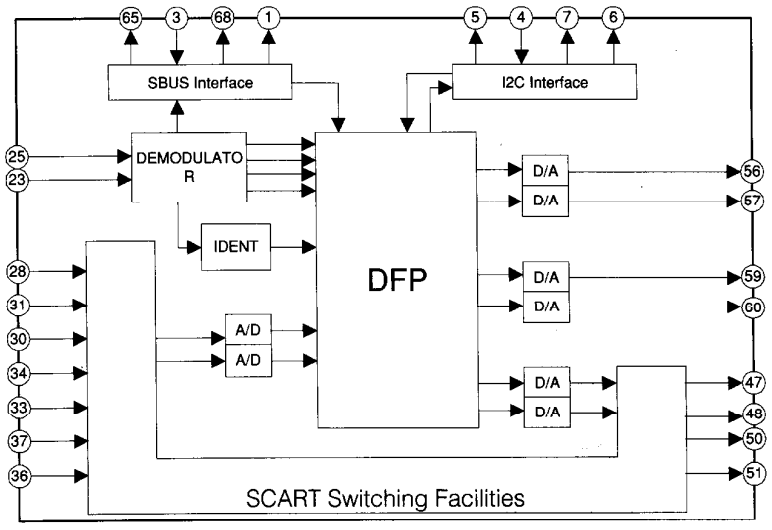
C BOARD IC703,704,705 TDA6111Q/N4



D BOARD IC802 STV9379



A BOARD IC201 MSP3410/MSP3400



MC-Service

SECTION 6
EXPLODED VIEWS

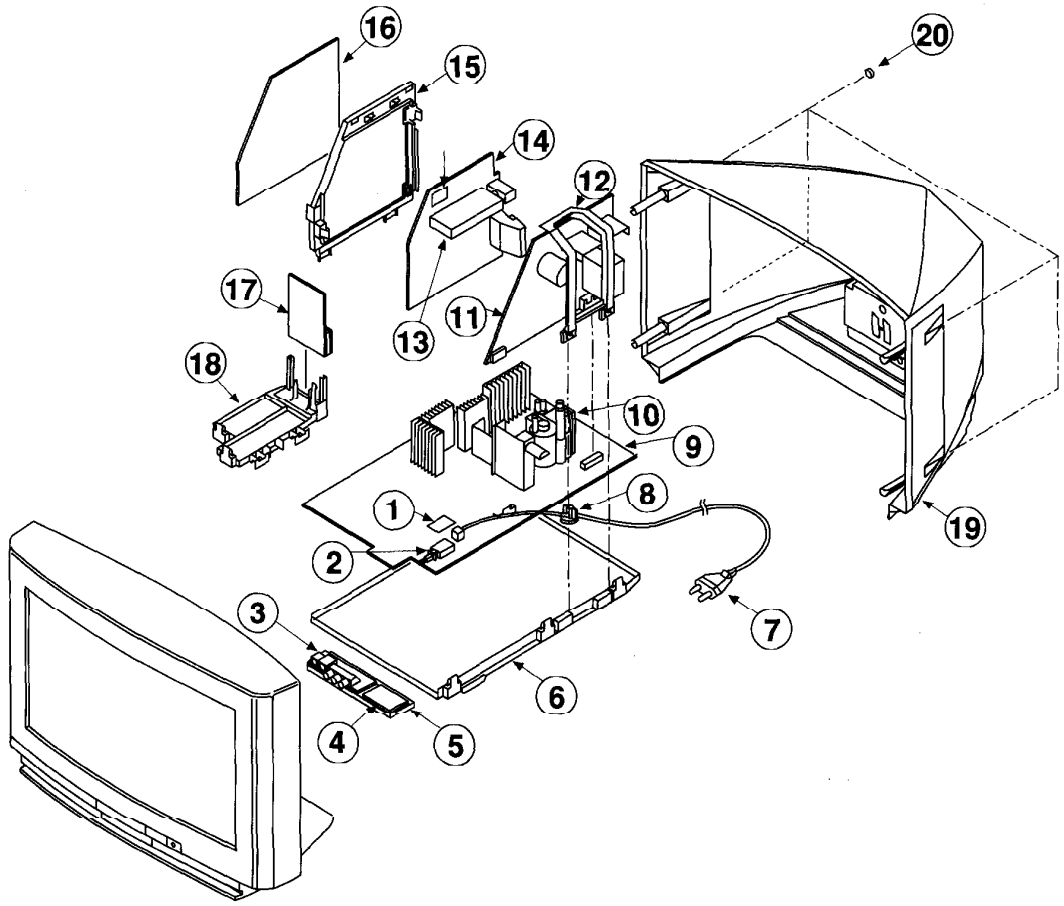
NOTE :

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remarks column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

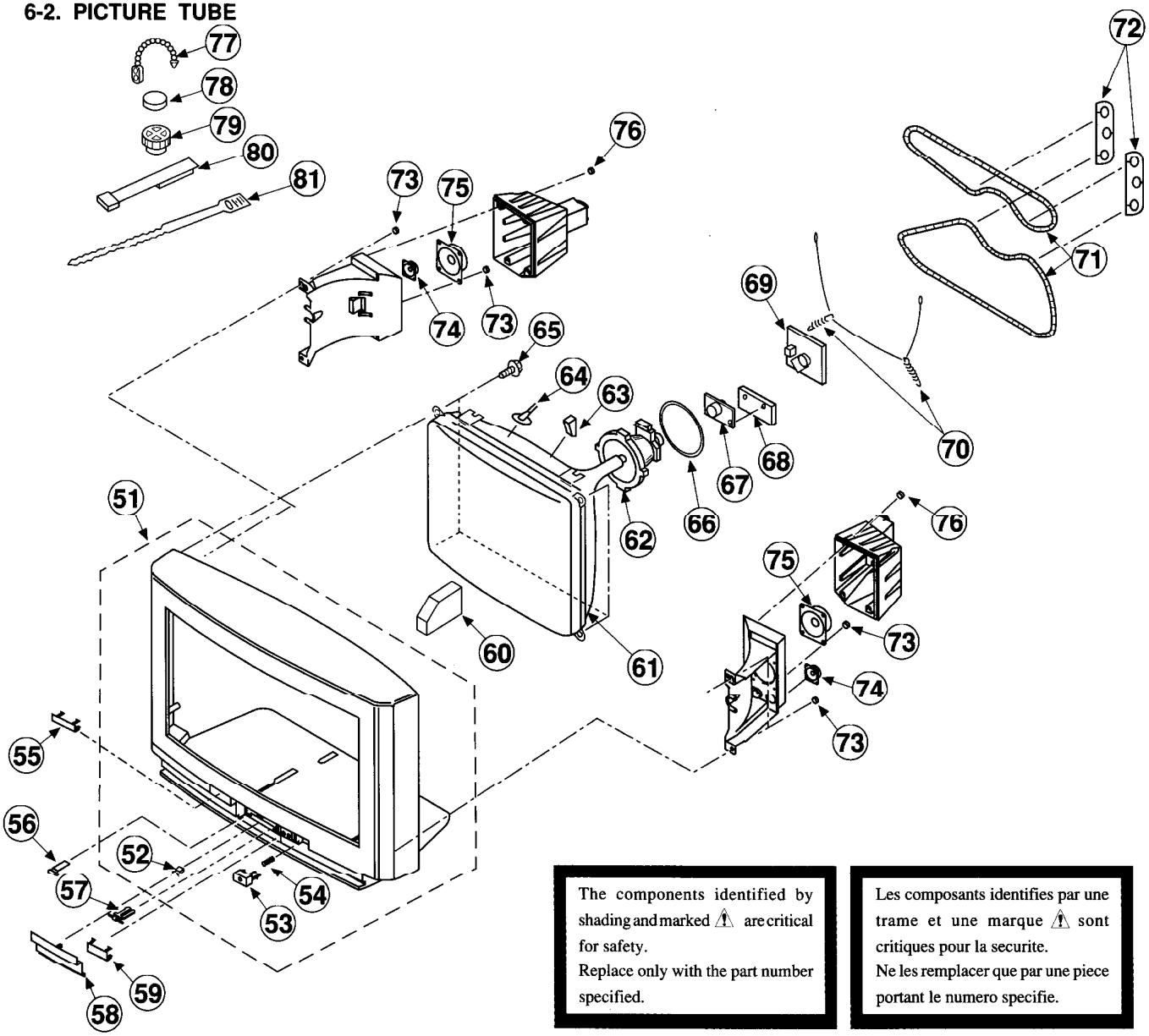
6-1. CHASSIS



REF NO	PART NO	DESCRIPTION	REMARK
1	4-386-611-01	COVER SWITCH	(KV-32WX10B/32WX10D)
[redacted]			
3	*A-1646-122-A	H1 BOARD,COMPLETE	(KV-32WX10B/32WX10D)
4	*A-1646-123-A	H2 BOARD,COMPLETE	(KV-32WX10B/32WX10D)
5	*4-203-627-01	BRACKET, H	(KV-32WX10B/32WX10D)
6	*4-203-457-01	BRACKET, MAIN	
[redacted]			
8	*4-202-531-01	AC CORD LOCK (SC)	
9	*A-1640-244-A	D BOARD, COMPLETE	(KV-28WX10B/28WX10D)
	*A-1640-245-A	D BOARD, COMPLETE	(KV-32WX10B/32WX10D)
[redacted]			
11	*A-1636-026-A	G BOARD, COMPLETE	(KV-28WX10B/28WX10D)
	*A-1636-027-A	G BOARD, COMPLETE	(KV-32WX10B/32WX10D)

REF NO	PART NO	DESCRIPTION	REMARK
12	*4-203-613-01	SUPPORTER, G	
13	1-693-338-11	TUNER/VIF (AEP)	(KV-28WX10D/32WX10D)
	1-693-340-11	TUNER/VIF (FR)	(KV-28WX10B/28WX10B)
14	*A-1632-567-A	A BOARD, COMPLETE	(KV-28WX10B)
	*A-1632-581-A	A BOARD, COMPLETE	(KV-32WX10B)
	*A-1632-569-A	A BOARD, COMPLETE	(KV-28WX10D)
	*A-1632-584-A	A BOARD, COMPLETE	(KV-32WX10D)
15	*4-203-612-01	BRACKET, A-B	
16	*A-1620-091-A	B BOARD, COMPLETE	(KV-28WX10B/28WX10D)
	*A-1620-092-A	B BOARD, COMPLETE	(KV-32WX10B/32WX10D)
17	*A-1651-084-A	J1 BOARD,COMPLETE	(KV-28WX10B/28WX10D)
	*A-1651-086-A	J1 BOARD,COMPLETE	(KV-32WX10B/32WX10D)
18	*4-203-537-01	BRACKET, J-K-T	
19	4-203-503-01	COVER, REAR	(KV-28WX10B/28WX10D)
	4-203-630-01	COVER, REAR	(KV-32WX10B/32WX10D)
20	4-302-404-03	SCREW (WASHER HEAD), (+P 4X16)	

6-2. PICTURE TUBE



The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF NO	PART NO	DESCRIPTION	REMARK
51	X-4200-269-2	BEZNET ASSY(KV-28WX10B/28WX10D)52-54	
	X-4200-291-1	BEZNET ASSY(KV-32WX10B/32WX10D)52-54	
52	4-047-464-01	CATCHER PUSH	
54	4-202-964-01	SPRING	
55	4-034-272-01	PLATE, CORRECTION, TLV	
56	4-045-250-01	DAMPER	
57	4-202-555-01	SHAFT, DOOR	
58	4-203-506-11	DOOR, CONTROL	
59	4-203-505-01	WINDOW ORNAMENTAL	
60	*4-203-098-01	SUPPORTER, CRT	
63	3-704-495-01	SPACER, DY	

REF NO	PART NO	DESCRIPTION	REMARK
65	4-203-216-01	PT-SCREW	
66	1-452-724-22	COIL, NA ROTATION (RT-165)	
67	8-453-011-11	NECK ASSY PICTURE TUBE (NA299-M)	
68	*A-1644-075-A	VM BOARD,COMPLETE(KV-28WX10B/28WX10D)	
	*A-1644-076-A	VM BOARD,COMPLETE(KV-32WX10B/32WX10D)	
69	*A-1638-092-A	C BOARD, COMPLETE(KV-28WX10B/28WX10D)	
	*A-1638-096-A	C BOARD, COMPLETE(KV-32WX10B/32WX10D)	
70	4-369-318-31	SPRING, TENSION(KV-28WX10B/28WX10D)	
	4-369-318-51	SPRING, TENSION(KV-32WX10B/32WX10D)	
72	4-045-294-01	HOLDER, DGC (29"/32")	
73	4-039-356-01	SCREW(3X12), (+) BV TAPPING	
74	1-505-484-11	SPEAKER (2.6CM)	
75	1-505-485-11	SPEAKER (8CM)	
76	4-039-358-01	SCREW(4X16), (+) BV TAPPING	
77	4-308-870-00	CLIP, LEAD WIRE	
78	1-452-032-00	MAGNET, DISK; 10MM Ø	
79	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM Ø	
80	X-4387-214-1	PERMALLOY ASSY, CORRECTION	
81	3-701-007-00	BAND, BINDING	

MC-Service